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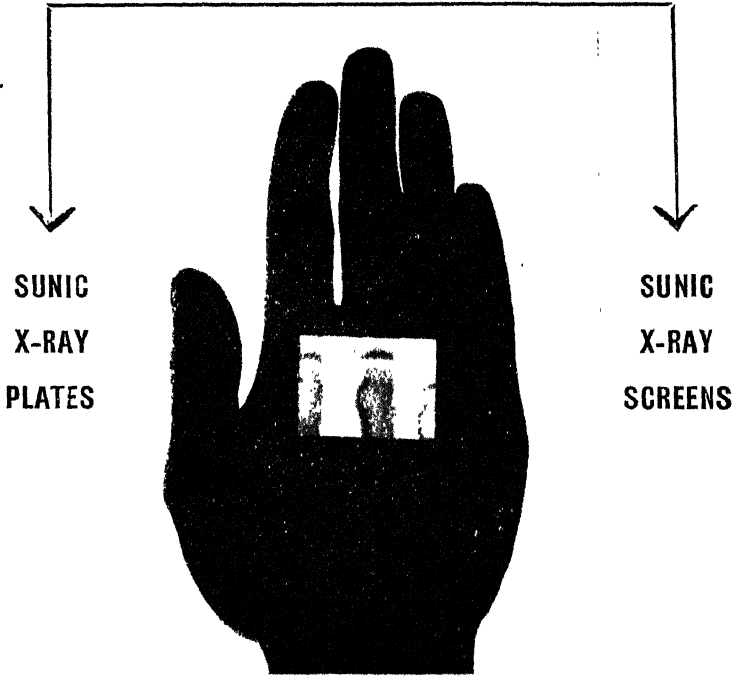
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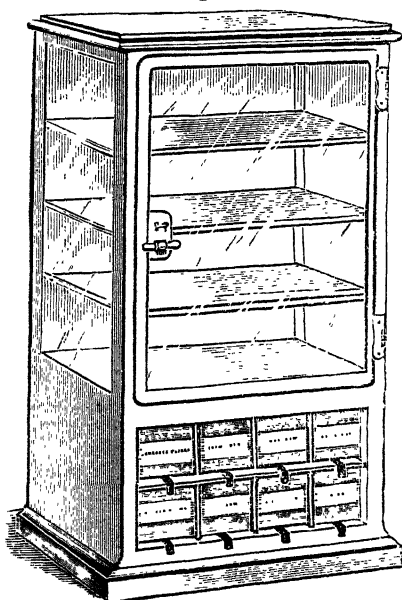
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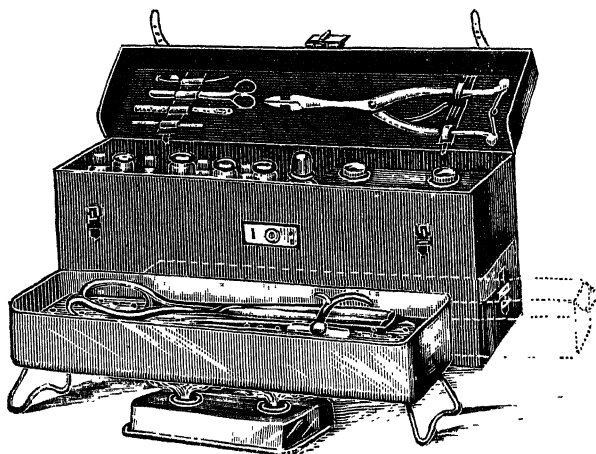
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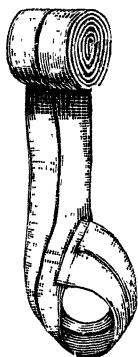
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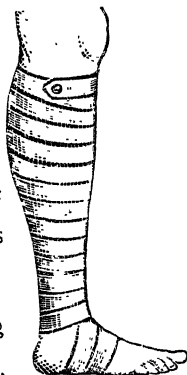


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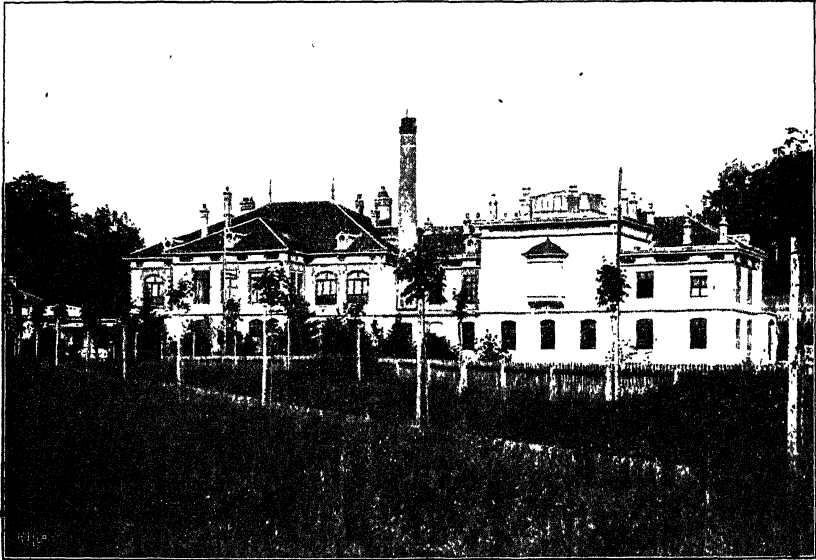
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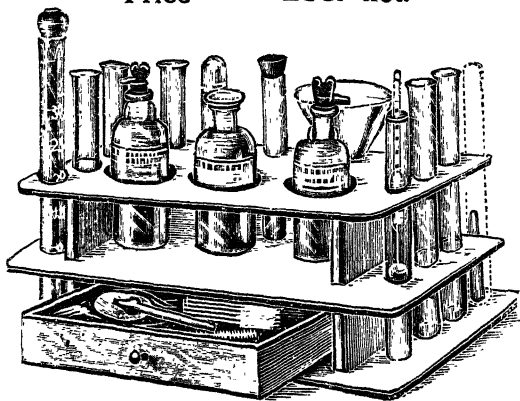
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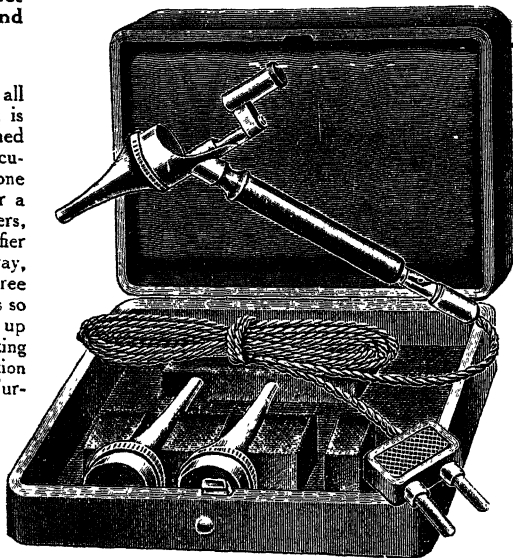
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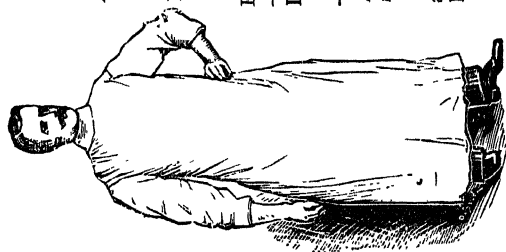


Fig. 1.

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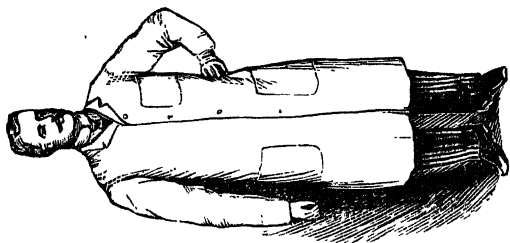


Fig. 2.

MUSLINETTE COAT, with

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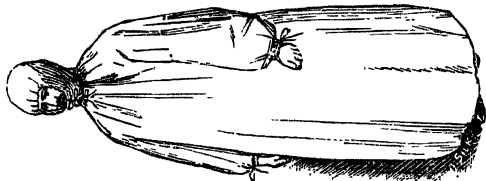


Fig. 3.

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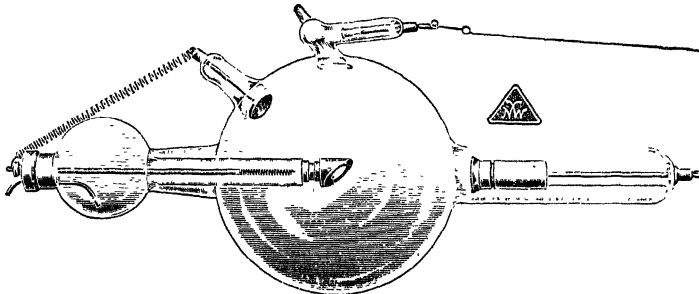
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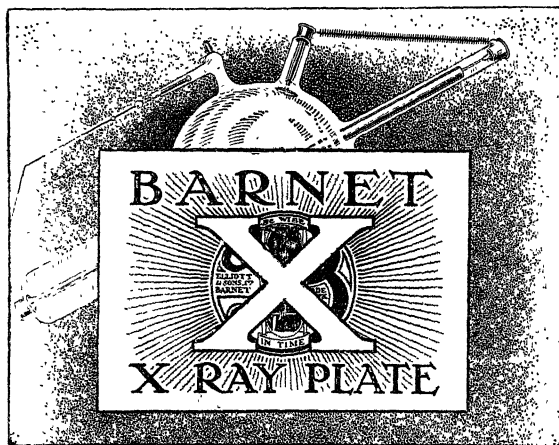
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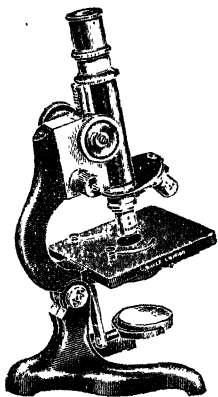
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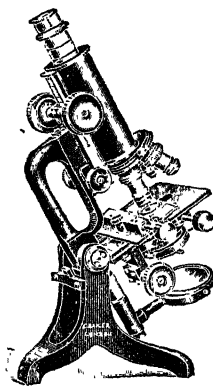
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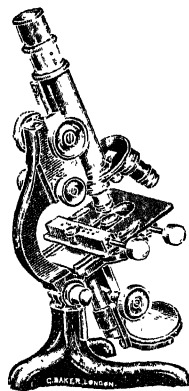
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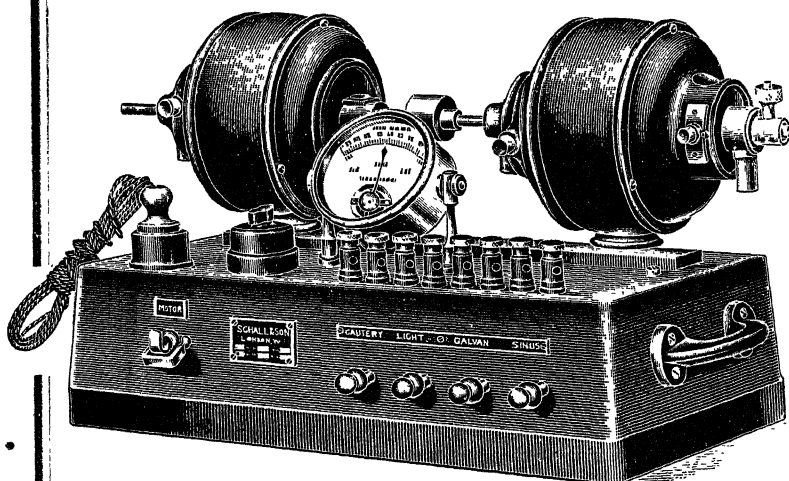
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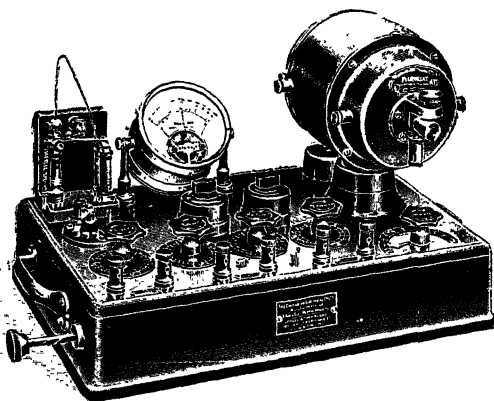
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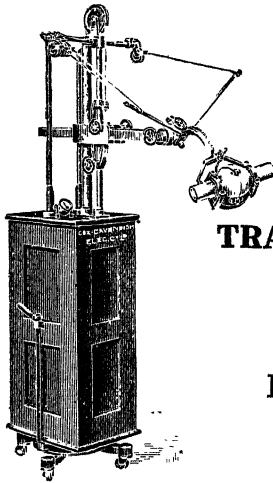
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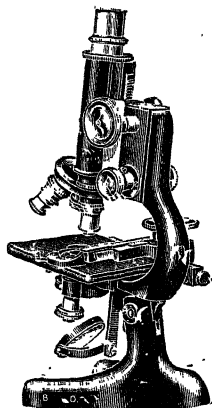
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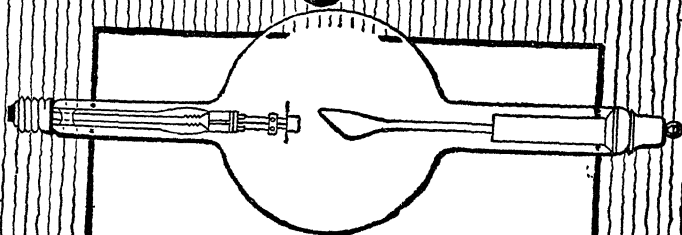


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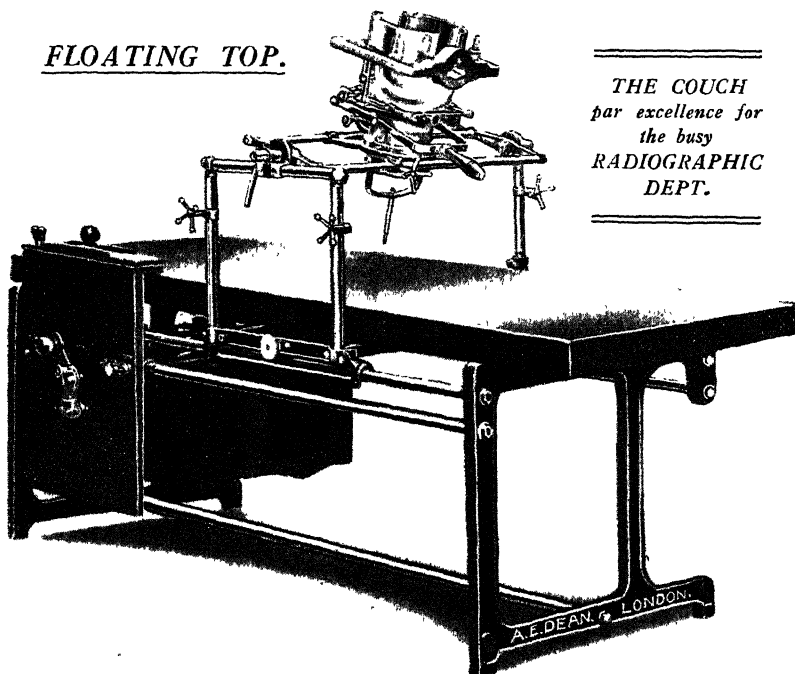
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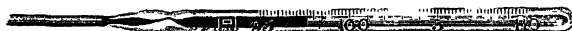
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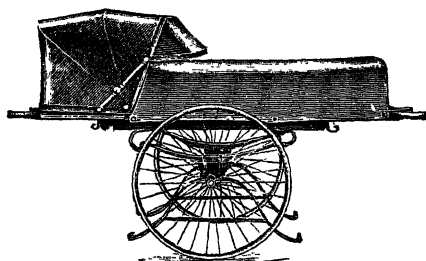
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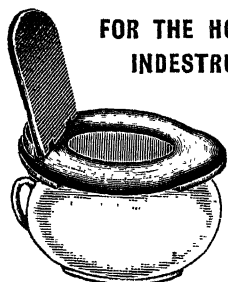
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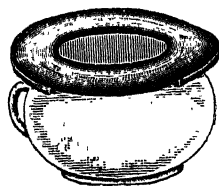
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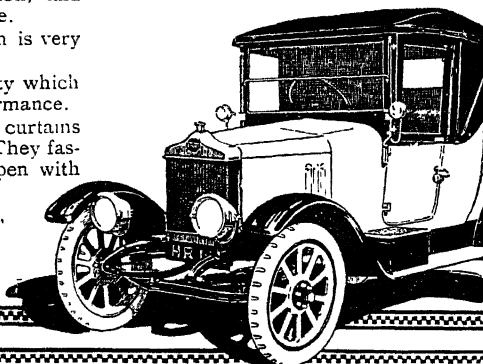
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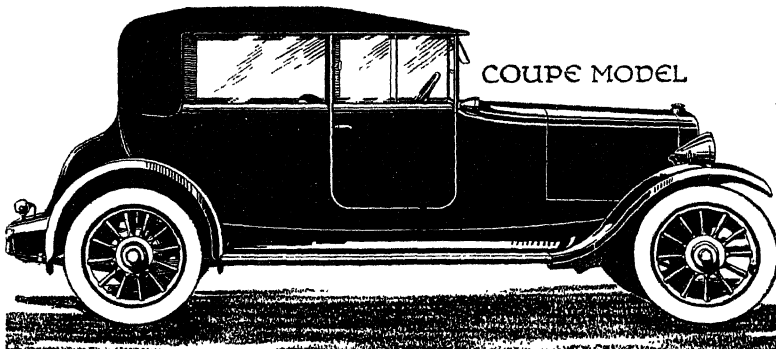
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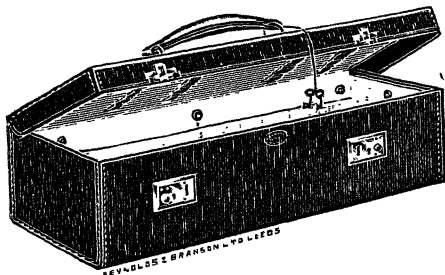
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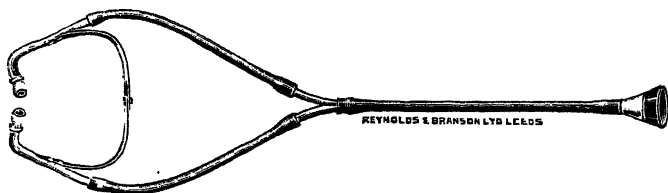


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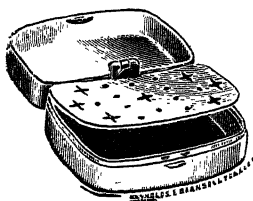
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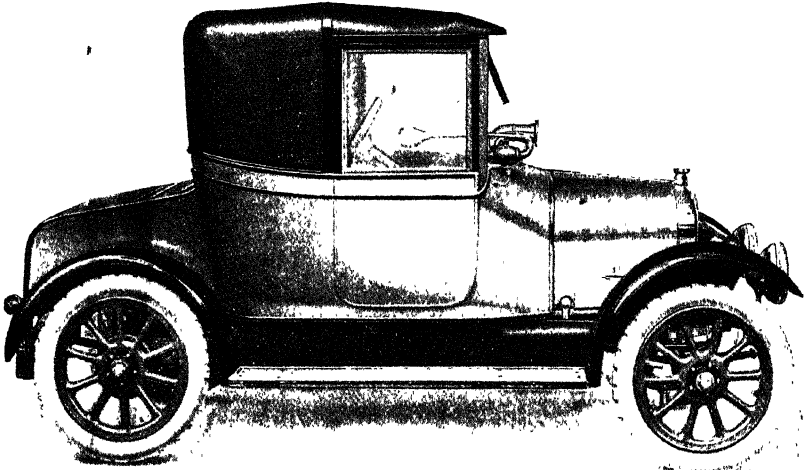
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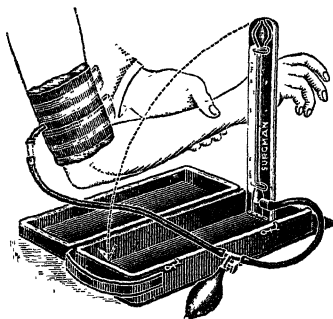
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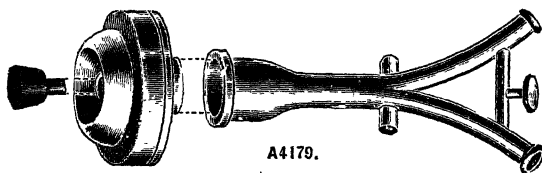
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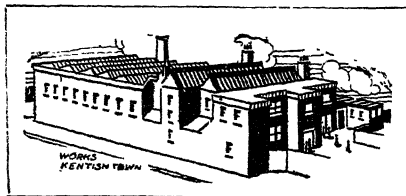
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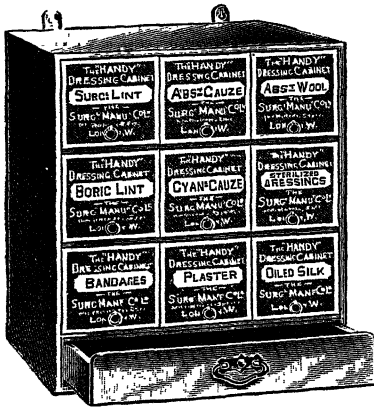
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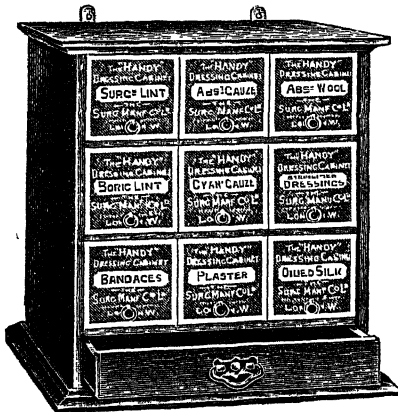
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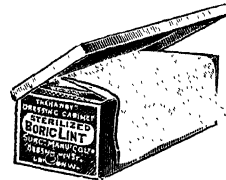
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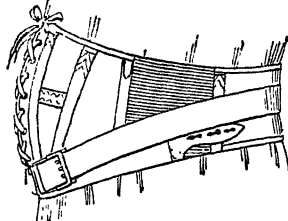
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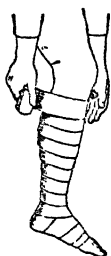
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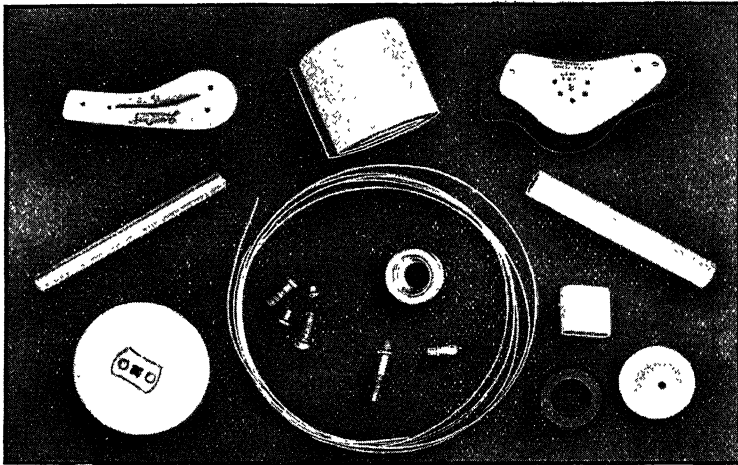
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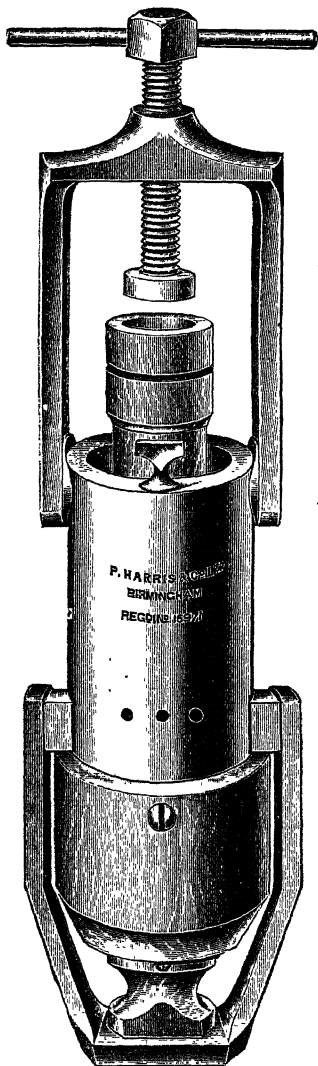


Fig. 7.

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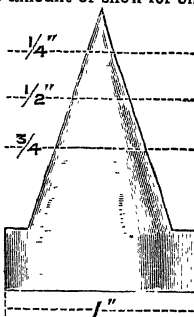


Fig. 9.

Fig. 9.—Diagram of Compressed Snow, showing broad base and cone-shaped projection. The transverse lines indicate the positions for cutting off the cone so as to produce a circle of any desired diameter.

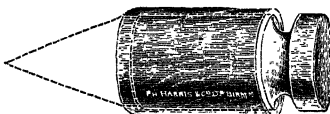


Fig. 10.

Fig. 10.—The applicator showing cone of compressed snow projecting from its lower end.

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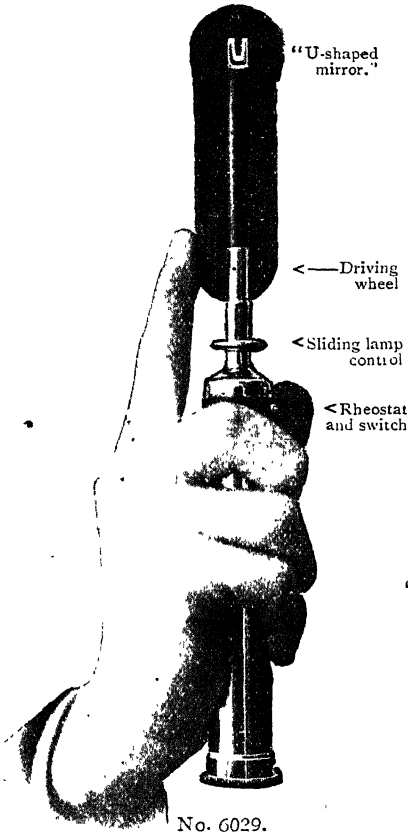
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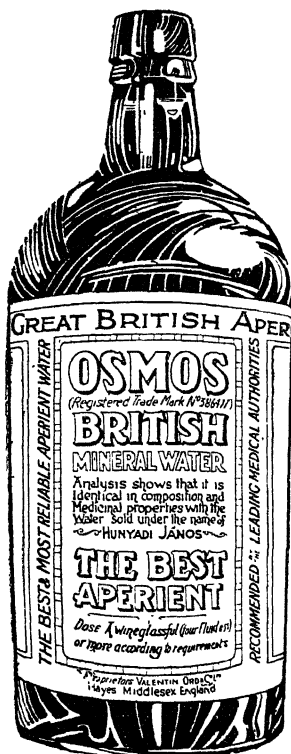
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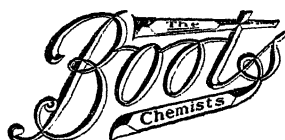
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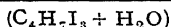
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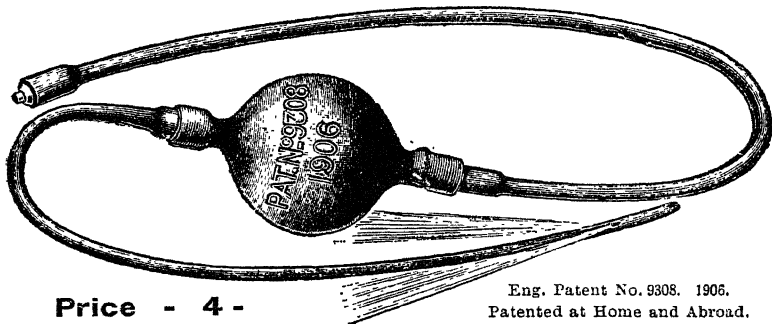
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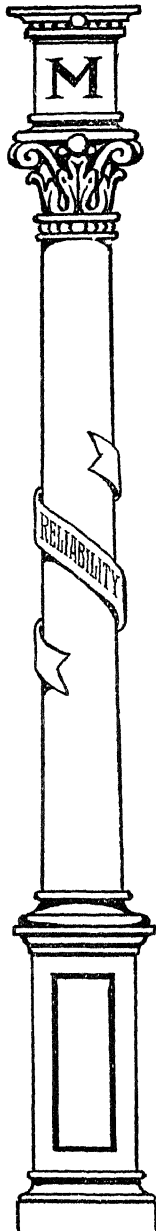
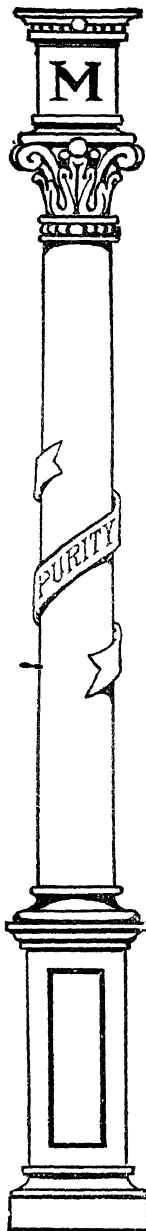
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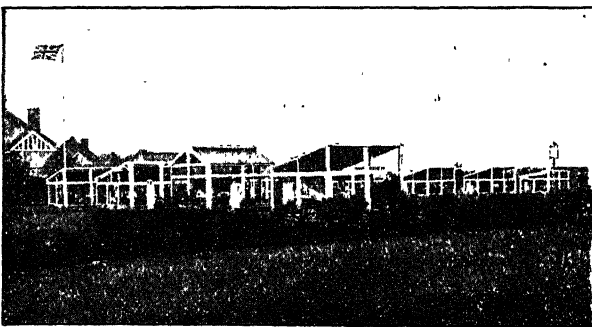


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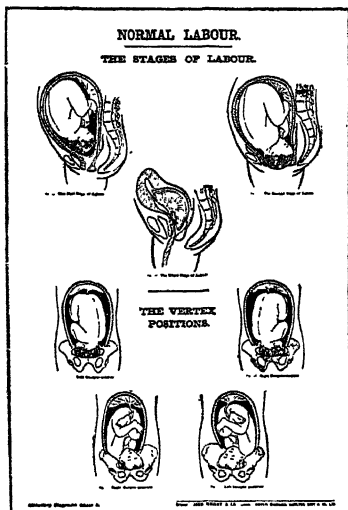
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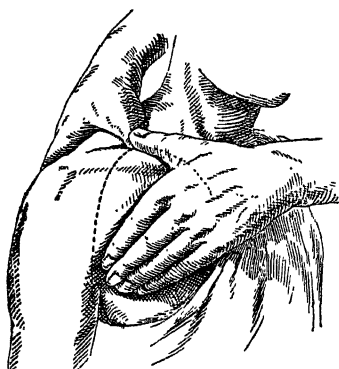
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*Fig. 130.—COMPRESSION OF SUBCLAVIAN
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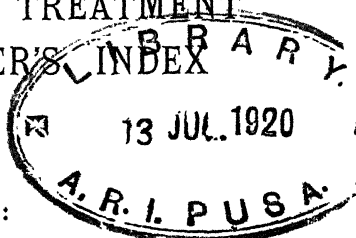
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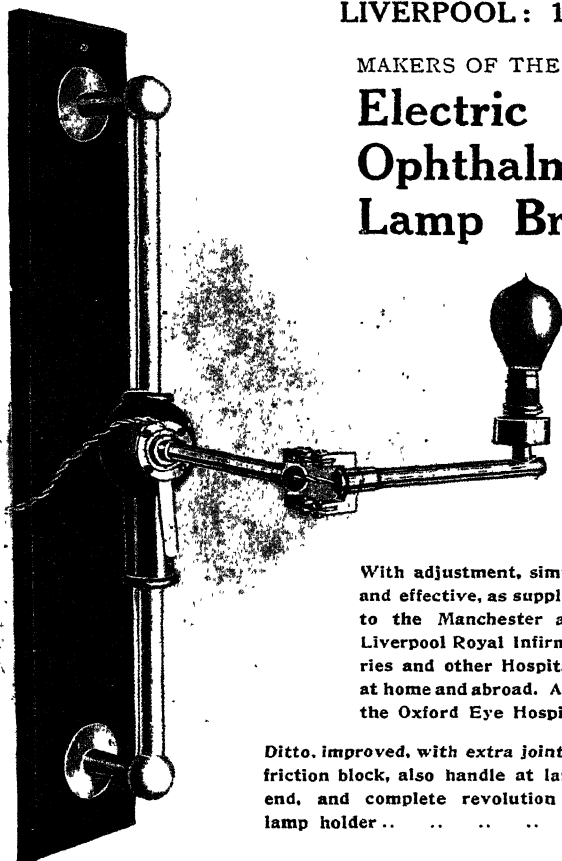
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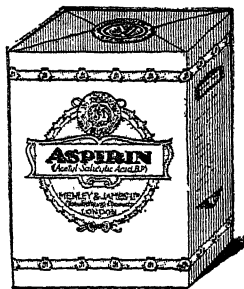
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Introduction.

A REVIEW OF THE YEAR'S WORK.

BY THE EDITOR.

THE thirty-eighth edition of the MEDICAL ANNUAL finds the World still in a state of protracted convalescence from the effects of the Great War. Last year we explained the extremely difficult conditions under which the book was produced. Some of these have improved ; but others, and perhaps worse, have arisen in their place. Questions of labour, continuously mounting costs in nearly every direction, and shortness of supplies cause grave anxiety.

The volume shows that our profession has not suffered from that form of malaise which seeks relief in longer hours of leisure. There is hardly a paragraph which is not the result of work accomplished after the day's routine has been completed. It is only in this way we can make those investigations which lead to the more efficient relief of suffering. We do not ask whether the sufferer is friend or enemy, whether the disease is the result of folly or misfortune ; the one desire which stimulates us is to help our fellow-man. This voluntary overtime work, whether undertaken on the battlefield, in our hospitals at home, or for the treatment of natives in distant lands, saves thousands of lives every year.

We state these facts in no spirit of boastfulness, but simply to contrast the mental condition which prompts our work with that which is so widely epidemic at the present moment.

We know that the War itself was the result of *egomania* cultivated as a national asset by a great nation. Those who suffer from this form of dementia are dominated by the idea that *their desires or ideals are only obtainable by the suffering or deprivation of innocent and unoffending persons ; and that their desires are so laudable that they are callous of any injury the attainment of them may inflict. The end justifies the means.*

The effect of the war was to suppress egomania for a time. But no sooner was the danger past, than we experienced a recrudescence of it in a more virulent form. History shows that egomania is never so dangerous to the community as when its cherished ideal is to ultimately benefit the human race in this world or the next. It then becomes infective and collective in its action. Since in its elementary form it is a survival of the predatory instincts of the animal, any plausible

excuse for attacking innocent and unoffending persons finds ready acceptance by those of low mentality. They are incapable of realizing that any scheme which involves war upon an unoffending community is sooner or later followed by a reaction destructive of the ideal which prompts the attack.

It is a pleasure to turn from movements which at present delay the progress of the world, to the provisions of the Public Health Act which are so lucidly stated by Dr. Joseph Priestley (*Section : Public Health*). Here we have a plan set out for the betterment of humanity which is wholly protective. It aims at guarding the welfare of the individual even before birth ; to make his entrance into the world as free of the troubles incidental to birth as possible ; to help his mother through the period of his infancy, and to remove the causes of the great mortality during this period : to accomplish this regardless of the folly or improvidence of those who should be the child's natural protectors. Above all it is necessary that every individual should have a home which can be maintained in a sanitary condition. The ideal which animates this scheme is good, because it recognizes that happiness is not so much an autogenous product as reflex of our environment.

The influence of mental conditions on physical activity has recently been demonstrated by Dr. Arthur Hadfield. He asked strong men to grasp a dynamometer, and found their average grip was 101 lb. He then suggested to them that they were very weak, and under hypnotic conditions the average grip was only 29 lb. But when he suggested that they possessed great strength, the average grip became 142 lb. He suggests that "the way to power is not to harbour our resources and store up strength by inactivity, but to find the way to tap the resources of power at our disposal so that we may flood our life and fill it with energy". (*"The Spirit"*, Macmillan & Co.).

The influence of suggestion in improving physical power is well illustrated by the method of overcoming the physical disabilities of tabetic patients by systematic re-education. M. Grossman, whose system is described (*Ataxia*), says that "perfect moving is the outward sign of perfect thinking", and that "there is a psychological as well as a physiological element in all symptoms and in all disabilities".

Systematic exercises have also been used with good results in the treatment of chorea (*Chorea*.)

The study of vitamins has led to very real advances in our knowledge of diet. These accessory food factors have been divided into three classes. (1) Fat soluble (A); (2) Water soluble (B); (3) Water soluble (C). A

table is given (*Infant Feeding*) showing the distribution of these three classes in various articles of food. But as they are all destroyed at the temperature required to cook these foods, the general principle is reached that some uncooked food shall form part of the daily diet. Salads, fruit, and especially oranges, are rich in vitamins. When unobtainable, an excellent vitamin product may be made by grating up a swede or other turnip, and squeezing the result through muslin. The great importance of the nursing mother taking a sufficient quantity of vitamin is now fully recognized. We have often found in the febrile disturbances of elderly people, that when orange-juice takes the place of beef-tea and soups, great improvement results. The articles on *Vitamins* by Dr. Robert Hutchison, and on *Infant Feeding* by Dr. Langmead, contain a large amount of practical information on a subject of daily importance to the practitioner.

Under war conditions the study of *Scurvy* has received a great impetus. Amongst remedies for providing the necessary vitamins, the value of germinated beans has been shown. Beans, peas, or lentils are soaked in water at 60° F. for 24 hours; the water is then poured away to permit germination, which takes place in about 48 hours. They are then cooked as rapidly as possible, without being allowed to become dry. An important point is that the preservation of the antiscorbutic properties of vegetables depends rather on the time than the temperature employed. All food should be cooked for as short a time as possible at boiling point. This applies to potatoes.

Dr. Herbert French in his article, *Deficiency Diseases*, says that the absence of certain necessary food factors from the dietary leads not only to functional and degenerative changes in the central nervous system, but to similar changes in every organ of the body; and that vitamin deficiency renders the body very liable to be overrun by a rank growth of bacteria. Two new deficiency diseases are considered under the name of *War Œdema* and *Hunger-osteopathy*.

The dietetic treatment of diabetes has received considerable attention. Graham's method is to give two hunger days, followed by two vegetable and egg days, and then, by a 'ladder diet', the quantity of food is gradually increased for twelve days. Full details of this diet are given in Dr. Robert Hutchison's article, *Diabetes*.

Botulism appears to have been traced to home-preserved vegetables and fruits. It was not the method of preservation which was at fault, but the failure to follow the instructions properly. This fact is worth remembering.

Acute *Eczema* in breast-fed infants may be due to indiscretions in diet on the part of the mother; alcohol and excessive quantities of sugar, etc., may render the milk an irritant to the infant.

Acute eczema in children is often due to excess of sugar, in which many patent foods are rich. Oatmeal, fat, butter, and excess of carbohydrates are other important factors. Louis Fischer recommends bicarbonate of soda, 3 gr. every hour by the mouth, to relieve excessive irritation of the skin. Dr. Langmead also speaks of the necessity of attending to the diet in these cases.

Recent investigations appear to show that patients with renal dropsy do best under a high protein diet and diminished carbohydrate (*Nephritis*).

From Dr. Carey Coombs' article, *Angina Pectoris*, it would appear that the vexed question of the cause of anginal pain is to be settled by referring it to the myocardium: either to gross changes resulting in death, or lesser stimuli from the same causes leading to milder attacks. This indicates the use of drugs which improve the circulation through the cardiac wall, and may explain the effects of nitrites in giving relief, and the value of caffeine in certain cases.

What do we exactly mean by 'high blood-pressure'? Carey Coombs gathers from recent papers that the systolic pressure should not be above 150, nor the diastolic below 90, in patients between 30 and 40. As to the cause of high blood-pressure, the answer is less exact—"Probably different things in different people", and in the hypertension of the climacteric period, Riesman advocates the avoidance of vasodilators, the removal of causes of worry, and the use of extract of corpus luteum. Hopkins regards these cases as benign in their course and not caused by renal disease (*Arterial Tension*).

Radioscopy has come into use in the diagnosis of *Heart Diseases*, and much valuable information has followed, as it is possible to take exact measurements of the size of the heart. Also the electrocardiographic method has proved of great use, especially in cases of arrhythmia and anomalous conditions. But if we were unable to form an opinion as to the future of cases of progressive cardiac disease without the use of these methods, a majority of our cardiac patients would go without a prognosis. Lewis tells us that "the essential is to know the amount of work which must be undertaken to bring forth distress—a method within easy reach of every practitioner".

Cardiac failure is regarded as most frequently due to an increasing incapacity of the cells of the myocardium to manufacture contractile substance as fast as it is demanded. In treatment we may either retard

the demand or promote its manufacture. The action of digitalis is regarded as having the former effect. The value of opium in conditions such as angina pectoris, acute pulmonary oedema, paroxysmal dyspnoea, and tachycardia is proved. Renal disease is not regarded as a contra-indication. In cardiac failure, strophanthin gr. $\frac{1}{100}$ has been injected intravenously with good effect.

Quinidine (an alkaloid of cinchona) has been used with good results by Bergmann in arrhythmia perpetua; its effects resemble those of digitalis (*Heart Diseases*).

While salvarsan has done good in cases of syphilis of the aorta, especially where its soluble forms are used, Carey Coombs is convinced of the necessity for using mercury and potassium iodide in these cases (*Syphilis of Aorta*).

That chronic appendicitis is not as common a cause of ill health and chronic digestive ailments as is generally supposed is again pointed out. There are few symptoms so difficult to interpret as pain in the iliac fossa. Grégoire in a recent paper gives some interesting facts in connection with this problem (*Appendicitis, Chronic*).

So many healthy appendices have been removed during recent years that we are quite glad someone has found a use for them. C. M. Rosser had a lady patient whose urethra had been removed some years before. She had no control of the bladder. He therefore removed the appendix, cut off the top, and converted it into a urethra. The patient subsequently had perfect control over micturition (*Vagina*).

Does vaccine treatment prevent recurrent nasal catarrh? Dr. Herbert French (*Nasal Catarrh*) admits conversion to the belief in the method, not only for catarrh, but for recurrent bronchial inflammation. The preference is given to autogenous vaccines. L. Mackey lays great stress upon the need for starting cultures directly after the swabs have been taken—even a postal delay of a few hours is detrimental. This increases the difficulty of the practitioner, even if he has the experience in the collection of the specimen and the technique employed which is also insisted upon. We think in most cases the practitioner will rely upon the prepared vaccines, which give good results in many cases.

In some cases of adenoids, thyroid extract $\frac{3}{4}$ gr. to 2 gr. daily has yielded good results. These cases were of the soft and gelatinous form which occurs in very young children (*Adenoids*).

A method of treating ozæna has been adopted, based on the view of substituting a carbohydrate medium for the alkaline protein medium in

order that the infecting proteolytic bacteria may be replaced by the harmless glycolytic bacteria normally found in the nose. It consists in the application of glycerin with 25 per cent of liquid glucose freely applied to the whole nasal cavity. Watson-Williams has tried the treatment and considers it satisfactory (*Ozæna*).

Extract of pollen, administered hypodermically before an attack of *Hay Fever* is expected, appears to have given good results in a number of cases.

Clinical experience shows that a large number of abdominal diseases may be simulated by the symptoms produced by visceroptosis. Thus, many cases of suspected acute and chronic appendicitis, gastric ulcer, or cancer of the stomach, have proved to be due to the effect of displacement of the abdominal viscera. Mr. Walton, in his article *Visceroptosis*, deals very fully with the whole question, both as regards its cause and treatment. The subject is of such great importance that we have given a large amount of space and illustration to its consideration.

In all diseases of the *Alimentary Tract* the value of x rays as a means of diagnosis has become of increasing value, as methods have improved and the ability to interpret results has increased. This method is very fully dealt with by Mr. Thurstan Holland in his article *Radiography*, and he expresses the opinion that there is practically no condition of disease of the gastro-intestinal tract in which a careful x -ray examination conducted by an expert has not great possibilities. In many cases it is possible to make an exact diagnosis by the x -ray examination alone, but in a larger number of cases when taken with other evidence it is seldom that it does not give results of a definite value.

In respect to *Radiotherapy* the treatment by x rays and radium has now reached a stage where it is not possible to draw a line definitely between the two. While each has an advantage in certain cases, there are some in which the position may be reversed. Experiments made by Perry show that x rays do not kill bacteria, nor do they prevent the development of experimental glandular tuberculosis. Elliott considers that epithelioma of the lower lip is best treated by radium, and that if early diagnosis is made the results are preferable to those of operation.

A mild sinusoidal current has been used by Barclay to promote the union of fractures in which union was delayed or did not take place.

In a case where ionization with magnesium sulphate failed to cure multiple small warts, Wainwright stated that each wart should be pricked with a fine needle before ionization. With a current of 20 to 25 ma. the treatment is uniformly successful.

Vesical and prostatic cancer have been treated with limited success by means of radium. The methods of application have been much improved, and are explained in detail in Mr. Thomson Walker's *Diseases of the Bladder*.

J. W. Potter some years ago shocked the American Association of Obstetricians by using internal version, mainly in normal cases of labour, in order to shorten the act, preserve the vitality of the mother and child, and save the time of the accoucheur. A year later he brought forward a fresh series of cases and was again denounced. But further investigation of his method and results has unquestionably shown the value of the procedure in skilful hands. W. E. Fothergill, in his article, *Labour*, describes the method in detail, and tells the story of an old Scotch doctor who used to say that "Providence had made one gross mistake, and that was letting children be born head foremost". During a long life he had always prevented this if possible.

A lack of carbohydrate is regarded by J. W. Duncan and V. J. Harding as a cause of the vomiting of pregnancy. They have used glucose or lactose with a high carbohydrate diet, with excellent results. Details of treatment will be found in W. E. Fothergill's article, *Pregnancy*.

Curetting is falling out of fashion. W. A. Lincoln says, "Given a curette and a woman, the old-time gynaecologist would always find endometritis". Hæmorrhage is not a symptom of it, and intense bleeding is rarely cured by curetting. Any intra-uterine instrumentation is a dangerous procedure. The indications for curetting practically narrow down to the removal of some products of conception and of bits of tissue for microscopic examination (*Disorders of Uterus*).

From Dr. Blomfield's article on *Anæsthesia* we learn that patients should be given liberal amounts of carbohydrates and milk for two days before the use of chloroform as an anæsthetic. It is dangerous to use it for fasting patients. Intramuscular injections of epinephrin and sulphate of quinine by the mouth on the days preceding the operation have some protective influence against chloroform poisoning. Further reports upon the use of rectal ether are favourable. It has been found especially useful in cases of exophthalmic goitre. Some directions as regards detail are given. The intrasacral injection of novocain is being used with greater frequency. The technique of the method is fully described. Intraspinal injections both for local and general anæsthesia have also received further attention.

Apotnesine is a new local anæsthetic which is claimed to have no toxic symptoms when given in doses of 12 grms.

Sir W. I. de Courcy Wheeler's article on *Thyroid Surgery* reminds us of the very important part this gland plays in the defensive mechanism of the organism. It has been compared in its rôle to that of the draught on the fire in its relation to the katabolism, and that it also influences anabolism is shown by the fact that tadpoles fed on thyroid may increase the rate of growth over four times.

The thyroid is a receiving and distributing organ for iodine, and where iodine metabolism is at fault, iodine or thyroidine will reduce a simple goitre. There is another type of goitre due to defective calcium metabolism, and in these cases the iodine content of the gland is increased. Such cases are said to be caused by continually drinking rain or distilled water. This point is worth remembering. In operations for exophthalmic goitre, local anæsthesia combined with twilight sleep has been recommended. The Goetsch reaction has been found useful for estimating the degree of hyperthyroidism; this is fully described in the article.

Dr. J. D. Rolleston deals very fully with the subject of *Influenza* in his article. He mentions that Sir StClair Thomson condemns the use of sprays and lotions during the acute stage. Inhalations of menthol and eucalyptus applied as a vapour by putting them in boiling water are recommended. For the paroxysmal cough, bromides and chloral hydrate give relief. Salicin, 20 grains every hour for twelve hours, followed by 20 grains every two hours for another twelve hours, has been used by E. B. Turner. Belladonna and gelsemium have been found to relieve the headache and backache, and shorten the attack. W. H. Wynn suggests the immediate use of vaccine, and finds it will sometimes abort the attack. R. Murray Leslie also strongly recommends vaccine treatment. Both gave a mixed vaccine containing streptococcus, pneumococcus, and *B. influenzae*.

The value of serum treatment in *Cerebrospinal Fever* is made very clear by the report of Sir Humphry Rolleston on cases treated in the Navy. In 502 cases treated without serum there was a mortality of 51 per cent; 214 cases received Flexner's serum alone or with others, and of these 30 per cent proved fatal. Stone and Truitt advise early and energetic treatment, and describe the methods they adopt.

Attention has again been called to the method of vaccination by injections. The technique employed is described in the article *Small-pox*. It has the advantage of avoiding an open wound requiring dressings. The percentage of positive reactions is very high. It is far less painful, and better borne by children.

During the last three years Hoefer has employed the serum of convalescent patients in the treatment of *Typhus*. The blood was taken six days after the temperature had become normal, and the serum injected after the addition of 0.1 per cent of carbolic acid. Large doses had to be given.

A *headache*, which is localized between the temples, deep in behind the eyes, is usually due to pituitary disturbance, and it yields to pituitary gland in 1-gr. doses one hour after meals. Some give larger doses. For headaches of the migraine type the administration of peptone 0.5 gr. in a cachet one hour before food is recommended. The rationale of the treatment is explained in the article *Migraine*.

The close of the war has by no means diminished the attention given to war neuroses; on the contrary, its cessation has produced neuroses in men who went through the war successfully enough. Such men find it impossible to adapt themselves to civilian employment. The article by Maurice Nicoll and J. A. M. Alcock dealing with the symptoms and treatment of the condition (*Neuroses of War*) contains much interesting and practical matter.

Considerable light has been thrown on the pathology of *Paralysis Agitans* by Ramsay Hunt, and his article with three illustrations will be of great interest to our readers. He says the essential and characteristic symptoms are due to atrophic change in the pallidal system of the corpus striatum. Paralysis agitans is, therefore, a special type of central palsy due to loss of function of the striospinal system, in contradistinction to spastic paralysis, which results from disease of the corticospinal system.

In the treatment of *Mental Deficiency* the use of atropine in full doses is recommended for the active, restless, and neurotic type; nux vomica in ascending doses for the listless, apathetic type. Caution is suggested in the use of mercury, iodine, and arsenic. Organotherapy has not given very good results, but one author gives a combination of the various extracts, and thinks they help.

Bedford Pierce considers that glandular extracts, except in cases of hypothyroidism, are disappointing.

An attempt has been made to trace neurasthenia to some chronic bacterial infection. Bedford Pierce points out that the organism found in neurasthenics may also exist in healthy persons, and asks, "What evidence is there that the bacteria found had anything to do with the nervous symptoms presented?"

Kempf has come to the conclusion that all the extreme conditions of dementia not caused by organic destruction, and all the cases of sexual perversion, are due for the most part to the close, long-continued confinement and seclusion in the wards of asylums. He recommends the cultivation of vigorous games and all athletic sports, also training in various arts and crafts (*Mental Diseases*).

From Sir David Bruce's analysis of cases of *Tetanus* treated during the war we learn that the use of tetanus antitoxin is gaining ground amongst those charged with the care of cases. The tendency of opinion now is to give antitoxin at the earliest possible moment and in large doses.

Both emetine hydrochloride and ipecacuanha continue to give good results in *Amoebiasis*. Sir Leonard Rogers advises that after a few daily injections of emetine (1 gr.), full doses of ipecacuanha by the mouth should be given. Oil of chenopodium was used with success in some cases; and in one case 30 grains of powdered nutmeg three times a day was successful.

For hookworm disease the oil of chenopodium holds its own. The hard gelatin capsule gave better results than the soft (*Ankylostomiasis*).

Tartar emetic continues to be used with success in *Bilharziasis*.

The intravenous injection of colloidal arsenic and iron is a promising remedy in *Blackwater Fever*.

A reduction of the mortality in *Cholera* resulted from the administration of large amounts of kaolin suspended in water. Kaolin is the basis of Sir Leonard Rogers' permanganate pills, which have been used for cholera with success for many years.

For *Dysentery* an antidysenteric serum has been used with variable reports. A rectal injection of 1 per cent tannic acid, retained for twenty or thirty minutes, yielded good results.

Colloid antimony sulphide given intravenously has been used by Sir Leonard Rogers for *Kala-azar*; this and other antimony preparations continue to give good results.

Much clinical experience has been gained during the year respecting the merits of gynocardate of soda A and sodium morrhuate in the treatment of *Leprosy*. Favourable reactions often followed the subcutaneous injection of the latter drug, which is not the case with the much more painful and slowly-absorbed gynocardate.

In the treatment of *Malaria*, Sir Leonard Rogers finds that cinchonine bihydrochloride is absorbed much more rapidly when injected intra-

muscularly than the similar quinine salt. Lemon-juice appears to have benefited patients with *Pellagra*; oranges had little effect.

The fact that *Sprue* is due to a special variety of yeast fungus called by B. K. Ashford *Monilia psilosis* is confirmed by C. Michel, who made a culture of this organism and treated a large number of cases with the resultant vaccine. The results were most satisfactory.

Vaccines have not given the anticipated results in *Actinomycosis*. By a special method of using *x* rays, excellent results were obtained, as will be seen by the photographs illustrating the article. Iodide of potassium appears to have done good in some cases.

Emetine hydrochloride has been used with great success in a case of *Hæmophilia*, after the failure of other remedies. The dose used was $\frac{1}{2}$ grain by hypodermic injection.

Doubts have been cast on the value of polyvalent antistreptococcal serum in *Erysipelas of the Face*. Dr. Herbert French is not amongst the doubters, and regards it as a most valuable adjunct to whatever local treatment may be employed. As regards local medication, the writer has found sol. ichthyol 1-4 applied as a paint invaluable.

We illustrate a new technique for applying phenol into the centre of a *Boil* introduced by Soresi. Collodium acidi salicylici has been found useful as a paint, especially for boils on the neck.

For *Impetigo*, compresses of $\frac{1}{4}$ per cent solution of permanganate of potash have given good results.

For the treatment of *Ringworm*, alcoholic solutions are to be preferred to aqueous. Salicylic acid and carbolic acid are perhaps the most useful remedies in solutions of 2 to 3 per cent.

The following ointment for *Ringworm* has been recommended by Dr. Hérain: copper sulphate 2, zinc oxide 15, lanolin 10, vaseline to 100. It may also be used for boils and soft chancres (*Infective Conditions of the Skin*).

A lotion containing the sulphates of zinc and copper has been recommended for *Ulcers of the Leg*.

We are less familiar with the dermatitis or eczema caused by *Rhus toxicodendron* than our confrères in the United States. It is said that the best method of prevention is to take a 1 per cent solution of the tincture of *rhus toxicodendron* in doses gradually increasing from 1 to 20 drops. This appears to give immunity for about a month. If this

is the case, the same principle might be adopted in cases susceptible to poisoning by primula and other plants.

There are doubts whether *Alcohol* is so deleterious an agent as many suppose, and regards it as a drug possessing definite therapeutic power. Apart from its importance as a readily oxidizable, utilizable food, he considers that it has valuable properties in combating sepsis. His experiments in typhoid fever and tuberculosis indicate that the bacteriolytic power of blood-serum is distinctly increased by alcohol.

In the various papers discussing alcohol and its effects we find no mention of the fact that alcohol is the only agent we possess that has the power to raise a persistent subnormal temperature. This effect cannot be due to its properties as a stimulant, because it has to be used regularly for a week or ten days before the temperature begins to rise. This happens when moderate doses are given with the meals.

While prohibition would severely restrict the liberties of the large majority who are never likely to use alcohol to excess, and would condemn to death numbers of innocent persons who would perish from exhaustion for the lack of it, the liberty of the alcoholic is carefully protected. We must wait until he commits a crime before his liberty can be restricted. If the medical profession were given powers in reference to alcoholism similar to those which they already possess in regard to sufferers from infectious diseases, alcoholism could be cured in its early stages. It is the physician, not the fanatic, who should prescribe the proper way of preventing alcoholism as well as other diseases.

The literature of syphilis is still concerned with the interminable discussion on the Wassermann reaction. The Medical Research Committee have now taken a hand in it. The general result is to show that the reaction obtained frequently varies with the laboratory to which the specimen is sent, and this is not wholly due to technique. But the Medical Research Committee conclude that in competent hands the Wassermann reaction may for all practical purposes be regarded as specific. If our readers will refer to Colonel Harrison's article (*Syphilis*) they will form their own conclusions.

Two new arsenobenzol compounds have been produced: one of these, sulphoxylate, is very stable and is sent out in ampoules ready for use. While more convenient than neosalvarsan, its effects are quite as good. Silversalvarsan is a colloidal compound of silver and salvarsan of low toxicity and high therapeutic value. The value of silver in protozoal infections has been already proved, and other combinations of silver

and salvarsan have been already used with success by Danysz, who recommends frequent small doses rather than massive doses at longer intervals.

Colonel Harrison, as a result of an analysis of over 35,000 cases treated with arsenobenzol, considers that the results are wonderfully good under the circumstances. He finds that the incidence of dermatitis and jaundice is closely parallel to the intensity of the individual course of treatment, i.e., it was less when the injections were spread over a longer period.

Abrams suggests the theory that the spleen and the liver become depositories of the syphilitic virus, and that if the spleen is made to contract by percussing the second lumbar vertebra, the virus is extruded into the circulation; while if the spleen is made to expand by percussing the eleventh dorsal space, it draws the fluid from every corner of the organism. The author suggests a cork and a tack-hammer for percussion. Here is a treatment which should have an application far beyond the range of syphilis. If we can make the spleen and the liver alternately contract and expand, by percussing the eleventh dorsal and second lumbar spine with a tack-hammer, one of our great problems of every-day practice is solved. The cholagogue pill becomes a relic of the past. But—what is the exact physiological connection between the second lumbar nerve and the liver and spleen? Why should percussing it cause contraction? We should like to be better informed on this point.

Experience shows that the abortive treatment of *Gonorrhœa* depends for its success upon its use at the earliest moment. Protargol and argyrol are the favourite remedies. Acriflavine has been lately used with some success. Failure is often due to secondary infection requiring injections of mercury oxycyanide. Colonel Harrison has not been impressed with the superiority of flavine preparations to permanganate. He suggests in the early stage the disinfection of all the parts with mercury perchloride (1–2000), the irrigation of the urethra with permanganate, and the injection of argyrol (10 per cent) or protosil (5 per cent), which should be retained for twenty minutes.

A new vaccine treatment has been used with considerable success by D. Thomson at Rochester Row. The reader should refer to Colonel Harrison's article, in which the methods are described.

Brandsford Lewis, in discussing the treatment of patients both before and after operation on the *Prostate*, attaches much importance to the specific gravity of the blood and the urine and the phthalein output of the kidneys. The hæmoglobin should be above 60 per cent, and the

phthalein output should be above 30 per cent for two hours. He prefers the suprapubic route and the two-stage method as safer. He regards spinal anæsthesia as the most dangerous of all. Ochsner objects to the suprapubic method as giving unsatisfactory drainage. Martin describes a method of siphoning the fluid from the bladder to avoid the difficulty.

Some very interesting facts in the diagnosis of cancer from the chemical study of the blood are contained in Oskar C. Gruner's article (*Diagnosis of Cancer*). Another useful method adopted by H. T. Deelman is to puncture accessible growths with a hollow needle to obtain cell fragments which can be fixed in formalin, dehydrated in acetone, and examined microscopically.

Sir James Paget found that in every case where he excised an eczematous nipple, carcinoma subsequently appeared in the breast. Hence complete removal of the breast, pectoral muscles, and axillary glands and fascia is recommended in every case (*Paget's Disease of the Nipple*).

The results of operation for *Cancer of the Larynx* have been very satisfactory. StClair Thomson reports that out of 38 cases operated upon, 22 are alive and well. The details of his method will be found in Watson-Williams's article.

Lockhart-Mummery calls attention to the absolute necessity of early incision in all cases of *Ischio-rectal Abscess*; otherwise a fistula is pretty certain to develop. For the treatment of *Hæmorrhoids* the ligature method is most favoured.

For *Pruritus Ani* a vaccine treatment has been used, cultures being made from the skin around the anus. Dry calomel well rubbed into the affected parts is advised. Lockhart-Mummery considers the operation devised by Sir Charles Ball as the only method which can be depended upon.

Aviation has introduced a new responsibility to our profession. We are called upon to decide whether a man is physically fit for the conditions met with while flying in the air. Many interesting physiological and psychic tests have been devised, and these are fully explained in Dr. Sutherland's article (*Medical Aspects of Flying*).

In the treatment of *Otitis Media*, autogenous vaccines taken from the ear, or the nose when the ear is not discharging, have given remarkable results. For chronic running ear, after removal of all granulations or obstruction, the discharge is mopped up down to the drum either by the patient or a nurse every fifteen minutes or so, and antiseptic drops are used. Syringing is only allowed in special cases. The results appear to be

excellent. In chronic ear suppuration a powder of bismuth and iodoform is used, being blown in with a fine-pointed insufflator. The crusts and dead epithelium are previously removed with hydrogen peroxide and the meatus cleaned out with spirit.

Loss of memory frequently occurs in diseases of the ear, especially the middle ear—most commonly as a loss of memory in one special direction, such as failure to remember names, places, etc. (*Ear*). The importance of lip reading in cases of deafness was recognized in Germany within three months of the commencement of the War. Mr. John S. Fraser says: "Many of the ills of deafness could be prevented if lip reading were prescribed for the slightly deaf before their deafness becomes a source of embarrassment. When the deaf man realizes that he can again understand the quietly spoken word, his attitude towards life is changed" (*Deafness*).

In many cases it is necessary to test the functional efficiency of the *Kidney, Liver, Spleen, or Stomach*. Oskar Gruner, in a series of articles under these headings, deals with the best tests to employ. Under the title *Latent Disease*, he also gives tests by which certain diseases can be detected, and their earliest periods. The subject is of great interest.

For tuberculosis of the larynx, the vapour of sulphur dioxide inhaled has given good results in some cases (*Laryngeal Tuberculosis*). Tuberculosis of the pleura has been remedied by the injection of iodoform suspended in liquid petrolatum (*Pleurisy*).

Pulmonary tuberculosis has been treated with chloramine-T (sol. 2 per cent). Sir Leonard Rogers considers that the use of sodium morrhuate is harmless in moderate doses (*Pulmonary Tuberculosis*).

Tuberculosis of the skin has yielded to copper salts. Combinations called 'brass paste' and 'brass oil' have been used (*Tuberculosis of Skin*).

In Sir W. I. de Courcy Wheeler's article on *Surgical Tuberculosis* an early symptom of tuberculosis of the hip is mentioned. This is a spasm of the muscles, the patient frequently pushing down the foot on the diseased side with the other foot, in an effort to effect extension and fixation. Muscular spasm is the best test for the active existence of tuberculous disease. A method is described by which it can be elicited in cases where it is not otherwise observable.

For *Pneumonia*, total rest, combined with large doses of strophanthus, has been recommended. Injections of camphorated oil, 10 to 20 per cent, have been used with success in croupous pneumonia. Good results have

been obtained, both in lobar pneumonia and general pneumococcal infection, by the antipneumococcal serum of the Pasteur Institute, Iodide of potassium, in a mixture combined with creosote, has also been recommended.

An investigation as to the conditions under which *Hæmoptysis* occurred in sanatorium patients, has revealed the curious fact that in 69 per cent it occurred while in the recumbent position, and in only 6 per cent while walking or working. When patients were instructed to sit up and walk about, and morphia was withheld, the results were more satisfactory than under the present method. Intramuscular injections of the fused chloride of calcium have been given to arrest hæmorrhage, with decidedly beneficial results.

In the treatment of *Hæmatemesis*, Bastedo administers morphia in combination with a maximum dose of strychnine. He does not believe in emetine. Adrenalin may be used, but it has the disadvantage of causing strong peristalsis. Transfusion is the most valuable remedy.

The treatment of *Empyema* is very fully considered in Sir W. I. de Courcy Wheeler's article, which solves some of the difficult problems connected with this condition when it occurs as a sequela of influenza. Moorhead lays stress on the aphorism that all cases of unresolved pneumonia are cases of undiagnosed empyemata. There is a difficulty in the interpretation of the physical signs, and the information given to help the practitioner in doing so is very valuable. The fact that a high-pitched percussion note is a sufficient indication for tapping in certain cases is an important point to remember.

Amongst the minor ailments in which we are thankful for aid, we may mention *Sea-sickness*. This, Major Lemon claims, can be prevented by packing the auditory canal with sterile gauze, by the aid of a match, tightly enough to cause a decided pressure against the drum.

Another is *Nocturnal Eneuresis*, which, during the War, was discovered to be more common amongst adults than was supposed. Here a strong galvanic current passed from the sacrum to the abdominal wall over the bladder has given good results (*Bladder*).

Thread-worms frequently resist the usual remedies, but basic aluminium acetate, in doses of 15 grains three times a day, has been found to cure the trouble. A dose of compound liquorice powder should be given for three or four days at the same time.

THE MEDICAL ANNUAL.

Part I.—Materia Medica and Therapeutics.

DICTIONARY OF REMEDIES.

By FRANK J. CHARTERIS, M.D.

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ADRENALIN AND APOTHESINE.

Hamilton¹ states that adrenalin is an antidote for the Circulatory Depression produced by Apothesine (a local anæsthetic suggested as a substitute for cocaine; it is less toxic than cocaine, and stated to be free from habit-forming effects). In guinea-pigs the minimum fatal subcutaneous dose of apothesine is several times that of cocaine, and it has been calculated that for a man of average weight the toxic dose is more than half an ounce of apothesine. It is difficult to see how toxic symptoms are likely to be produced by such a non-toxic drug except in cases of hypersensitiveness. When given in toxic doses to dogs by the intravenous route, a very rapid depressant action on the circulation is produced. Hamilton has found that the simultaneous administration intravenously of adrenalin 0.0001 grm. will protect the dog from the otherwise fatal intravenous dose of 0.32 grm. apothesine. Thus the local subcutaneous use of adrenalin and apothesine seems indicated, as the adrenalin will diminish the absorption of the drug, and lessen the risk of untoward ill effects.

REFERENCE.—¹*Surg. Gyn. and Obst.* 1919, July, 92.

ALCOHOL.

The United States, before going 'dry', devoted considerable attention to the question of alcohol. Some of the papers which deal with the more general aspects of the question are interesting. Smith E. Jelliffe¹ discusses alcohol in some of its compensatory aspects. He considers that man is an energy system, which captures, transforms, and releases energy. He does not consider that food supplies the energy so used, but merely supplies us with the material over which energy can travel. Food, according to his view, is merely substance for structure; it is not an energy source of any great matter. The energy itself comes from light, heat, sound, gravity, inertia, etc. The most important source of energy for man is that which comes through special energy containers invented by him—e.g., language, ideas, generalizations, concepts, i.e., symbols of various kinds. The writer holds that alcohol acts by increasing the synaptic threshold resistance of the neuron chains, thereby tending to exclude stimuli from entering the human body or parts of it. Thus alcohol, in its first action on the highest synaptic junctions, makes it impossible for the individual to receive as much energy through symbols as previously. In this way he acquires a certain amount of rest.

A. A. Brill,² discussing alcohol and the individual, states that with few exceptions all his chronic alcoholic patients were psychopaths. Practically all

individuals who chronically indulge excessively in alcohol are emotionally more or less diseased. He states that a psychiatric examination will not necessarily show all mentally deficient, though a great many of them are; but, judging by a standard of adjustment of continuous effort, in some direction they are all deficient. Many cases, when cured of the alcoholic habit, break out in some other manifestation of uncontrolled primitive instincts. For such as these there is a certain safety in periodic alcoholic indulgence. Even the normal man finds that alcohol removes inhibition, and makes inexorable reality less burdensome.

Hare³ refers in a paper to a report by White, who states that alcohol is not a habit-forming drug, but that alcoholism is a symptom of some underlying functional condition. Given a number of mental defectives, these, though deprived of alcohol, nevertheless progressively diminish in efficiency. Hare himself doubts whether alcohol is so deleterious an agent as many suppose, and suggests that, if at all, it is really only indirectly responsible for the pathological changes which are ascribed to it in the liver, kidneys, heart, and blood-vessels. It is a drug possessing definite therapeutic power, but equally powerful to do harm if wrongly used. It can be employed with advantage both in health and disease. It has a definite action as a **Sedative** and **Vascular Relaxant**. Apart from its importance as a readily oxidizable, utilizable food, he considers that it has valuable properties in combating the condition known as **Sepsis**. His experiments in typhoid fever and tuberculosis indicate that the bacteriolytic power of blood-serum is distinctly increased by alcohol. In perfect health the ready oxidation of alcohol rather interferes with normal oxidation processes; but when the same individual is fatigued and worn out by nervous and physical stress, it not infrequently happens that he has not the energy to digest and utilize ordinary foodstuffs with his normal ability, and, in this state, alcohol in small quantities, by giving a readily available amount of **Temporary Energy**, enables the worn-out man to take in and utilize the foodstuffs which are really needed, and the accompanying sedative action reduces nervous irritability, and produces a beneficial condition of mental relaxation. Thus the young, healthy man requires no alcohol, but it may well be useful for those devitalized by old age or illness. (*See also* ALCOHOLISM, p. 32.)

REFERENCES.—¹N. Y. *Med. Jour.* 1919, i, 934; ²*Ibid.* 928; ³*Ther. Gaz.* 1918, Sept. 15, 609.

ANAPHYLACTIC SHOCK.

Lewis¹ advises the slow intravenous injection of antiserum to prevent acute anaphylactic shock where large quantities of serum have to be employed. Friedberger and Mita have demonstrated the efficacy of this method of administration in guinea-pigs, where many times the fatal dose can be given to sensitized animals if the serum is diluted and injected very slowly. Lewis has successfully repeated these experiments on sensitized animals, and recommends, as the result of his work, that when large doses of serum require to be given to man, as in the treatment of pneumonia, it should be injected very slowly and as dilute as possible.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, Feb. 1, 329.

ANTHELMINTICS.

Sollmann¹ has tested the action of anthelmintics on the common earthworm. The worms were either kept in a watery solution of the drug under question, or the test was carried out in an artificial intestinal juice containing 0.04 per cent bilin and 1 per cent sodium bicarbonate. All the anthelmintics used clinically are markedly toxic to earthworms. The earthworm is thus a con-

venient means for testing the anthelmintic action of drugs *in vitro*. It cannot of course give information about the clinical value, as it leaves out of question such factors as local irritation of tissue, absorption, and toxic action on the host. The most effective anthelmintic substances *in vitro* were found to be mercuric chloride, mustard oil, and cupric sulphate. It is suggested that cupric sulphate injection might be of value in **Threadworm Infection**. Filix mas, pelletierine, thymol, chenopodium, beta-naphthol, and chloroform are all highly effective anthelmintics. So, also, is santonin in the artificial intestinal fluid. Somewhat less effective, but still quite toxic, are kamala, kousso, pomegranate. Fresh melon pumpkin seeds are highly effective. The active principle is soluble in water but destroyed by boiling. Spices such as pepper, mustard, onions, are active, and the addition of pepper increases the activity of other anthelmintic remedies. Mixtures of anthelmintic remedies are worth trying, as, *in vitro*, summation action is obtained from such mixtures. The oleoresin of filix mas seems to keep well, as old preparations when tested were found still active. Pelletierine tannate was also fairly uniform in its action. Many substances toxic to earthworms produce as a primary action an irritant effect, shown by the withdrawal of the worms from the neighbourhood of the poison. Possibly this vermifuge action may result in expulsion of worms when the concentration of the drug is not sufficient to kill them.

REFERENCE.—¹*Jour. of Pharmacol.* 1918, Oct., 129.

ANTISCORBUTICS.

It is now generally accepted that **Scurvy** is a deficiency disease dependent on the lack of a vitamine. In infancy the necessary vitamine is supplied by fresh milk, but it is easily destroyed by heat. Pasteurizing cow's milk at 63° C. (145-1° F.) for thirty minutes has produced outbreaks of infantile scurvy. Recently Hart, Steenbock, and Smith show that sterilization for ten minutes destroys the antiscorbutic vitamine, and ordinary commercial unsweetened condensed milk, and commercial dried milk powders, have lost their antiscorbutic properties. Infantile scurvy and ordinary scurvy of adults are readily cured by administration of antiscorbutic vitamine contained in fresh food. For this purpose fruit-juices have long been used. It is known that fresh oranges and cabbages contain valuable antiscorbutic principles. Preserved lime-juice is popularly believed to be of value, but Chick¹ and her co-workers at the Lister Institute find it useless in preventing the onset of experimental scurvy. Fresh lime-juice has some antiscorbutic potency, but is four times weaker than fresh lemon-juice. An interesting historical investigation into the efficacy of lime-juice in scurvy has been carried out by Alice Henderson Smith,² who states that the juice used successfully in olden days was the juice of lemons and sweet limes, not that of the West Indian sour lime from which commercial lime-juices are now prepared. Many attempts have been made to preserve the antiscorbutic properties of fresh juices so that they may be prepared on a commercial scale. Recent work by Harden and Nilva³ on lemon-juice is interesting. They find that removal of free citric and other acids does not destroy the antiscorbutic properties of the residue. Later, Harden and Robinson⁴ state that the valuable antiscorbutic properties of fresh orange-juice are not destroyed by distilling at 40° C. under reduced pressure. They obtained in this way a solid residue of high antiscorbutic potency which remains active for six months if kept in a dry atmosphere at room temperature.

When investigating the antiscorbutic value of raw juices of root vegetables, Chick⁵ and her co-workers discovered in raw swede-juice a cheap and valuable antiscorbutic, approximating in value to fresh orange-juice. Raw carrot-juice was ten times less efficient, and raw beetroot-juice is practically negligible in

antiscorbutic effect. Fresh grape-juice, often recommended as an adjunct to the diet of artificially reared infants, is almost devoid of antiscorbutic action. (See also SCURVY and other articles in 'Index of Treatment', *infra*.)

REFERENCES.—¹*Lancet*, 1918, ii, 735; ²*Jour. R.A.M.C.* 1919, Feb. and March; ³*Biochem. Jour.* 1918, Oct., 259; ⁴*Jour. R.A.M.C.* 1919, Jan.; ⁵*Lancet*, 1918, ii, 774.

ATROPINE.

Stokes¹ claims that the nitritoid reaction following the injection of salvarsan preparations is a form of **Anaphylactic Shock** possibly due to precipitation either of the drug itself from its colloidal solution or of the colloids of the blood plasma. This nitritoid crisis can apparently be inhibited by the previous injection of $\frac{1}{37}$ gr. of atropine. Smaller doses than this failed to give protection. It is given subcutaneously. Stokes describes the production of anti-anaphylaxis by Besredka's method, by the use of a very small dose of neosalvarsan, 0.05 grm., given one hour before the administration of the dose proper. This was successful in several cases.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, Jan. 25, 241.

BLOOD TRANSFUSION.

A. Rendle Short, M.D., F.R.C.S.

Once again the year has produced a voluminous literature upon this topic, but as it was dealt with in considerable detail in the *MEDICAL ANNUAL*, 1919, a brief review will suffice.

Pemberton¹ contributes a very interesting history of the operation. It has been supposed that the first case on record was the giving of the blood of three youths to Pope Innocent VIII in 1492 by a Jewish physician, but apparently he drank it. The three boys all died. Lower in England and Denys in France appear to have been the pioneers of the art in the seventeenth century, but they used animals' blood, and so many deaths resulted that the Supreme Court in France forbade the practice. In the middle of the nineteenth century transfusion with human blood became quite popular, but there were a good many deaths, attributed at the time to air in the veins, but which we now know were caused by incompatibility of the donor's blood.

A large number of English, American, and French writers publish more or less enthusiastic appreciations of the value of transfusion for the **Shock-hæmorrhage Syndrome** after war wounds (Waugh,² Fleming and Porteous,³ Lacoste, Lartigaut, and Picqué,⁴ Harrison,⁵ Charles and Sladden⁶). Most of them believe that it is much more effectual than gum transfusion. Two or three fatal cases from incompatibility are mentioned, and some others in which, on account of warning symptoms, the transfusion had to be stopped after only a few cubic centimetres had been given.

Leyton⁷ used transfusion in 10 cases of **Pernicious Anæmia** and other blood diseases. He reports temporary benefit in the majority, but it is not a lasting cure. Garbat⁸ had marked improvement in 10 out of 15 cases. I have seen a patient who appeared to be dying from this disease revived in an extraordinary way (arsenic was also given), and now, five months after, the blood-count is almost normal.

Hunt and Ingleby⁹ relate a case in which a patient with **Hæmorrhagic Gastric Ulcer** was apparently snatched from imminent death.

Some French observers have tried the effect of blood transfusion for **Influenza**; at first they used the blood of convalescents as donors, but normal blood seems to do just as well. They believe that the method is valuable.¹⁰

Reactions after Transfusion.—There is a good deal of difference of opinion as to whether rigors and fever are more frequent and more severe after citrated-blood transfusions than after the use of unaltered blood. Lindeman,¹¹ using

unaltered blood injected by his special syringe, has given 136,800 c.c. of blood without a death, and in his last 214 transfusions there have been no rigors. Lewisohn, in 200 citrated-blood transfusions, saw rigors in 20 per cent. According to the experimental observations of Drinker and Brittingham,¹² the reaction is due to: "(a) Very rare gross incompatibilities which escape *in-vitro* detection; (b) Changes in the platelets, part of the process of coagulation; (c) Direct action of the sodium citrate on red cells promoting hæmolysis".

REFERENCES.—¹*Surg. Gyn. and Obst.*, 1919, March, 262; ²*Brit. Med. Jour.* 1919, ii, 39; ³*Lancet*, 1919, i, 973; ⁴*Presse. Méd.* 1919, Aug. 25, 473; ⁵*Jour. Amer. Med. Assoc.* 1918, Oct. 26, 1403; ⁶*Brit. Med. Jour.* 1919, i, 402; ⁷*Lancet*, 1919, i, 379; ⁸*Jour. Amer. Med. Assoc.* 1919, Jan., 1; ⁹*Lancet*, 1919, i, 975; ¹⁰*Presse Méd.* 1919, April, 181; ¹¹*Jour. Amer. Med. Assoc.* 1919, June 7, 1661; ¹²*Arch. Internal Med.* 1919, Feb., 133.

F. J. Charteris, M.D.

Ross and Hund¹ have used successfully citrated immune blood in the treatment of **Pneumonic Disturbances Complicating Influenza**. Pulmonary tests to ensure compatibility of blood and exclude syphilitic infection are carried out. About 250 to 500 c.c. of citrated immune total blood is given at a time, and the injections may require to be repeated. It is best to use the transfusion early in the pneumonia, so that the reserve powers of nature are not exhausted. The temperature usually falls after the infusion, and the patient clears up mentally, with relief of toxæmia. In test series, earlier convalescence and increased recovery-rate followed the use of the citrated immune blood. Complications and sequelæ were practically nil.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, March, 640.

BRASS PREPARATIONS.

Ellis¹ claims that brass compounds, either alone or associated with picric acid, are of value in the treatment of **Tuberculous Deposits of the Skin**, especially **Lupus**. Quite innocuous to healthy tissue, these brass combinations exert a selective, apparently caustic, action on tuberculous tissue when applied locally. Four preparations are in use: (1) Brass paste, an oily preparation of a compound of basic sulphates of zinc and copper; (2) Brass oil or bro, a preparation of the soluble portions; (3) and (4) Each of these preparations in combination with approximately 1 per cent of picric acid, called trino-brass and trino-bro. When the brass or bro is used, there is some risk of setting up auto-infection from tuberculous absorption; but the trino preparations eliminate this effect, though occasionally picric-sensitiveness of the external cutaneous layers is troublesome. All forms of brass preparations are applied locally. Brass paste is applied every two or three days under zinc plaster, while bro is applied either as a foment on gauze with jaconet covering, once twice or thrice weekly, or simply painted on. It is stated that supplies of these preparations are obtainable from Mr. Jack L. Robinson, pharmaceutical chemist, Middlesbrough, Yorks.

REFERENCE.—¹*Lancet*, 1919, i, 415.

CALCIUM CHLORIDE.

Fishberg¹ supports Saxtorph's claim that the intravenous injection of calcium chloride is often of great value in controlling the **Abdominal Pain and Diarrhœa of Tuberculosis**. He uses 5 c.c. of a 5 per cent solution, and finds that beneficial results often follow a single injection. The most suitable cases are those where the intestinal symptoms have not persisted long. When they have lasted several weeks, though repeated calcium chloride injections may mitigate slightly the frequency of the stools, no amelioration of pain occurs.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, June 28, 1882.

CAMPHORATED OIL,

Benz¹ records a mistaken administration of camphorated oil instead of castor oil in an institution. Twenty children, ages from 4 to 10, each received from 1 to 1½ tablespoonfuls of liniment of camphor. The dose was given at 6.30 a.m., and initial toxic symptoms began at 7.15 a.m. In the more marked cases there were general convulsions, with rigidity and cyanosis. Milder cases showed only nausea. Under emetic treatment with mustard and water all the patients recovered promptly.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, April 26, 1217.

CHLORAMINE-T.

Carnot and Bondouy¹ have investigated the action of this drug as an **Intestinal Antiseptic**. Its bactericidal action is fairly marked. *B. typhosus* and *B. paratyphosus* are destroyed in 24 hours by 1-5000, and 1-1000 inhibits the growth of *B. coli*; *Entamoeba histolytica* is not affected. The toxic action is very slight, so that large quantities can be given. Free chlorine is slowly liberated in contact with saliva, but both gastric and duodenal juice rapidly decompose the drug, and the activity of both juices is inhibited by 1-500 of the drug, but is not affected by 1-2000. To protect the drug from the juices and to delay absorption, chloramine-T should be administered either in tablets or in cachets containing 0.05 grm. chloramine-T and 0.3 grm. animal charcoal, or a similar quantity of agar-agar. Four cachets or tablets should be given daily. Clinically, rapid improvement is noted in gastric disturbance characterized by fetid stools and diarrhoea. Bacillary dysentery is promptly relieved, but amoebic dysentery is not benefited. Good results were also obtained in several cases of intestinal toxic infections.

REFERENCE.—¹*Paris Méd.* 1918, Dec. 7, 468 (abstr. *Prescriber*, 1919, April, 86).

COPPER SULPHATE.

Hérain¹ states that copper sulphate is useful in dermatological work in **Impetigo**, **Acne Rosacea**, in **Pyodermitis**, **Wounds**, and in certain types of **Eczema**. Intravenous injections are useful in all **Staphylococcus Infections**, especially **Furunculosis**, and are useful but less efficacious in **Streptococcus Infections**. Copper sulphate is a good **Intestinal Disinfectant**, when given by the mouth, and diminishes the sputum in **Tubercle of the Lungs**. He suggests the following formulæ:—

Strong ointment: Copper Sulphate 2; Zinc Oxide 15; Lanolin 10; Vaseline to 100. The copper sulphate is dissolved and incorporated with the lanolin.

Weak ointment: contains 0.2 per cent of copper sulphate, the other constituents remaining unchanged.

Powders, similarly containing 2 and 0.2 per cent solution, are used.

For intravenous injection, 5 to 10 c.c. of ½ per cent solution is used.

For oral administration, pills or cachets containing ½ gr. with 4 gr. prepared chalk can be given twice daily.

The strong ointment is suitable for favus, ringworm, papillomata, seborrhœic eczema, ecthyma, soft chancres, buboes, and infected ulcers; the weak ointment for acne rosacea, sycosis, impetigo, eczema, burns, scalds, healthy ulcers, surgical wounds, infected itch; the strong powder for soft chancres and open buboes; and the weak powder for eczema and for weeping non-infected surfaces.

REFERENCE.—¹*Presse Méd.* 1918, Oct. 31, 555.

GELATIN CAPSULES.

Knowlton¹ finds that soft capsules containing chenopodium oil are not very reliable in the treatment of **Hookworm Infection**, as they are insoluble. With hard gelatin capsules containing the same dose of oil much better results were obtained.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, March 8, 701.

GLUCOSE.

According to Lyon,¹ the substitution of glucose for saline solutions has effected a distinct progress in therapeutics, as glucose is nutritive, free from any deleterious influence on the kidney, and is a good diuretic when given subcutaneously or intravenously. Glucose does not aggravate chloride retention. It may be used subcutaneously as an isotonic solution, 47 gm. of pure crystallized glucose to 1000 c.c. water; or in combination with other drugs, in which case the glucose is reduced—e.g., glucose 2.5 per cent, sod. bicarb. 0.7 per cent; glucose 1.5 per cent, bromide of sodium 0.1 per cent; glucose 2 per cent, theobromine 0.1 per cent, trisodic phosphate 0.4 per cent. The subcutaneous isotonic solutions are used for removing toxins from the blood. Hypertonic solutions are too irritating for subcutaneous administration, and are given intravenously. Their special field is to produce instant dehydration by setting up copious diuresis. The intravenous injection must be given very slowly, not more than 250 to 300 c.c. per hour. For children the dose is 50 to 100 c.c. according to age. A suitable formula is: pure crystallized glucose 30 per cent in distilled water. The solution may also be medicated—e.g., glucose 10 per cent, sod. bicarb. 3 per cent; glucose 24 per cent, trisodic phosphate 0.8 per cent, theobromine 0.2 per cent. Glucose solutions can also be given per rectum. Though glucose injections do not aggravate chloride retention, their chief contra-indication is the risk of producing a sudden rise of pressure in heightened blood-pressure and weakened myocardium. The indications for the use of glucose solutions are, in the main, the same as those for saline solution. They are particularly recommended in **Acute and Chronic Enteritis**, **Athrepsia**, **Cyclic Vomiting of Childhood**, **Acetonuria**, **Uncontrollable Vomiting of Pregnancy**, and in all cases of **Inanition from Gastro-intestinal Causes**. The diuretic action is valuable in many cases of **Anuria or Oliguria**. The dist-intoxicant action is of service in **Severe Toxæmia of Appendicitis**, **Bronchopneumonia**, **Typhoid Fever**, **Prolonged Operations**, and in **Eclampsia**. Further, it may be used in **Carbon Monoxide or Chloroform Poisoning**.

REFERENCE.—¹*Med. Press and Circ.* 1919, March 5, 180.

HÆMOSTATICS, LOCAL.

Hanzlik¹ has investigated the action of alleged hæmostatics on artificial wounds made in the pads of dogs' paws. The experiments were so devised that the wounded area was kept irrigated with sodium citrate solution. At stated periods the hæmostatic drug under test is added to the citrate solution. To avoid vasomotor disturbance the animal is kept under anaesthesia, and the nerves going to the wounded part are severed. The most efficient local hæmostatic was found to be **Adrenalin**, but its action is rather evanescent, coming on almost immediately, but, when the vasoconstrictor effect passes off, there is an increase in the amount of bleeding. The maximum hæmostasis is reached in two-and-a-half to three minutes, and lasts about four to fourteen minutes. Following, in order of efficacy, come pituitary extract, tyramine, acetic acid, ferric chloride, quinine urea-hydrochloride, tannin, sodium bicarbonate, barium chloride, cane sugar, sodium chloride. **Pituitrin** and **Tyramine** act promptly, the former after a short period of increased bleeding,

with temporary diminution in hæmorrhage, which is not completely arrested; the hæmostasis is rather more slowly produced than with adrenalin and lasts a shorter period, but as a rule there is no subsequent increase in bleeding when the hæmostatic action passes off. The best of the astringent remedies was **Ferric Chloride** (1 per cent), which was more constant though less effective than tannin (1 to 5 per cent). Alum was not good; in high concentrations it actually increased hæmorrhage. **Tannin**, 1 to 5 per cent, gave fairly good results, but the glycerin of tannin was unreliable. Thromboplastic agents—cephalin, coagulen, thromboplastin—were unreliable. The following alleged styptics increase bleeding on local application: cotarnine salts (stypticin and styptol), antipyrin, peptone, emetine, and alum. Orthoform in 1 per cent solution distinctly increases local bleeding.

In a subsequent paper² the action on superficial bleeding of these drugs given intravenously was tested. Again the most reliable drug was adrenalin; tyramine was somewhat less reliable, and pituitary extract was variable. The following drugs had an action roughly parallel to their action on blood-pressure: coagulen, cephalin, thromboplastin, horse serum, stypticin, gelatin, emetine. Nitrites and hydrastis cause increase in bleeding with a fall in blood-pressure.

REFERENCES.—¹*Jour. of Pharmacol.* 1908, Sept., 71; ²*Ibid.* 119.

HEXAMETHYLENETETRAMINE.

Trendelenburg¹ has reinvestigated this drug without throwing fresh light upon it. He points out the dependence of the action upon the liberation of formaldehyde, and the importance of the H ion concentration in the liberation. From experimental investigation he concludes that the only therapeutic field for hexamethylenetetramine is **Disinfection of the Bladder**. Neither in blood nor in the cerebrospinal fluid is sufficient formaldehyde liberated to prove bactericidal. Only in the event of the urine being acid is there any prospect of an efficient antiseptic action in the bladder. If the urine is not acid, the attempt should be made to render it so by dieting (meat diet), or by administration of acid phosphate of sodium. He suggests that if frequent or permanent catheterization is required, an acid depôt should be left in the bladder after each catheterization. For this purpose 50 to 100 c.c. of 5 to 7 per cent solution of acid phosphate of sodium may be introduced into the bladder.

REFERENCE.—¹*Munch. med. Woch.* 1919, June 13, 653.

INTRAVENOUS EMULSION THERAPY.

Mansfeld¹ claims that by physical means he is able to obtain localized action of fat-soluble drugs in the spleen, bone-marrow, and lungs. His attention was first directed to the question when investigating the alleged fat-splitting ferment of blood. It is well known that the fat of the chyle rapidly disappears after it reaches the blood. Further, if an emulsion of fat is added to drawn blood, it rapidly disappears in the presence of oxygen, and is no longer removable by ether extraction. Mansfeld has discovered that the fat is not split up, but merely combined with albumin, and becomes masked. With appropriate methods the masked fat can be demonstrated. On the other hand, if a fine fat emulsion be injected into the jugular vein, the blood from the carotid shows no free or masked fat. Evidently during the passage through the lungs the fat has been altered or removed. By experiments on animals, he has shown that, as a matter of fact, 40 per cent of the fat injected into the jugular vein is retained by the lung tissue, and remains there for at least one hour. Experiments with intravenous injections of finely suspended Indian ink show that there is accumulation of the pigment in the bone-marrow, spleen, liver, and lungs. He suggests the possibility of utilizing this peculiar distribu-

sion of fat particles in therapy, by administering in a fine emulsion antiseptics soluble in oil. He mentions that some success has been obtained in **Lung Conditions** and **Malaria**. He claims that a prolonged local action is obtained. A suitable fine emulsion is prepared by adding a little oleic acid to olive oil and shaking with faintly alkaline NaCl solution. In this way up to 3 per cent oil can be emulsified, and over a litre of this emulsion can be injected intravenously into dogs without disturbance.

REFERENCE.—¹*Wien. klin. Woch.* 1918, July 11, 775.

IODINE, NASCENT.

Maurice¹ has introduced a new method of applying nascent iodine in **Diseases of the Nose, Ear, and Throat**. He heats iodoform, and insufflates the vapour directly to the focus in tonsil, nose, maxillary sinus, or middle ear. In chronic otitis media the insufflations powerfully assist the usual remedial procedures. Not more than two or three insufflations should be given at one sitting lest painful distention be produced.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, ii, 563.

LAVAGE, TRANSDUODENAL.

Jutte¹ states that transduodenal lavage flushes the bowel from pylorus to rectum, and brings about powerful stimulation of peristalsis. This is accomplished by inserting a duodenal tube just beyond the pyloric muscle and allowing a sufficient quantity of water to flow through the tube into the bowel to produce a thorough flushing. The fluid should be slightly hypertonic, so as to remain unabsorbed. After employing this form of lavage successfully in medical cases, he has now tried it in surgical cases, and obtained successful results in six cases of **Post-operative Ileus**, in a case of **Incessant Hiccough**, and in one case of **Puerperal Eclampsia**. In the ileus cases one lavage was sufficient to restore normal peristalsis. The case of hiccough also required only one treatment; but the eclamptic received two treatments.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, i, 929.

MAGNESIUM SULPHATE.

Meltzer¹ records experimental work which shows that magnesium sulphate retards or almost completely arrests inflammation produced by scalds. He uses a 25 per cent solution, and in rabbits found that immersion in it for two or three hours was very efficacious. He states that this solution is also effective in the treatment of **Scalds** and **Burns** in man. Burns of the first and second degrees were invariably arrested in their development when molecular solutions of magnesium sulphate were applied early. Third-degree burns ran as a rule a more favourable course under application of this remedy than under any other treatment. Higher concentrations than 25 per cent seem to exert a still better influence. In advanced stages of second- and third-degree burns the magnesium sulphate applications are less striking in effect owing to the suppuration, but still seem to exert a favourable influence.

REFERENCE.—¹*Jour. of Pharmacol.* 1918, Nov., 211.

MARGOSIC ACID.

According to Chatterji,¹ margosic acid is a mixture of fatty acids of the oil derived from the seeds of the margosa tree. Potassium margosate is more soluble than sodium margosate, and is less painful on intramuscular injection, less likely to cause thickening of the veins on intravenous application, and is less hæmolytic. The hæmolytic action of margosates causes hæmolysis of an emulsion of washed human erythrocytes, but increasing quantities of serum diminish the hæmolysis. Chatterji states that margosic acid and its salts are

powerful therapeutic agents in combating infections of diverse nature. It seems to have some beneficial influence in **Syphilitic Conditions**, as the clinical manifestations clear up rapidly, and the Wassermann reaction is rendered less distinct. It is most effective against tertiary lesions. The antibacterial properties of margosates against micrococci is low in test-tube experiments, but the writer claims that *in vivo* the antibacterial action is much more pronounced. Though *in vitro* it does not arrest the growth of fungi, clinically it has a definite curative action in **Ringworm**, **Pityriasis Versicolor**, and in **Itch**; both the acid and its salts have distinct antiparasitic properties. Clinically the drug has proved useful in skin affections—**Scabies**, **Eczema**, **Psoriasis**. The drug was administered by injection, and applied locally as zinc margosate ointment. The writer states that there is no recurrence after stopping treatment. In **Septic Conditions**, either acute or chronic, the injection of margosates, and local application of the acid or salts, have proved useful, improving the local conditions, reducing temperature, and lessening toxæmia. (For the use of margosates in **LEPROSY**, see under that heading.)

REFERENCE.—*Indian Med. Gaz.* 1918, Oct., 377.

MERCURIC CHLORIDE. (See also DRUG ERUPTION.)

Vecki¹ says that mercuric chloride administered intravenously has a markedly beneficial effect in **Gonorrhœal Arthritis**, and has given him satisfactory results in **Acute and Chronic Suppurating Surgical Ailments**. He has also used it successfully in a small series of cases of **Erysipelas**, and in the recent **Influenza** epidemic he employed intravenous injections with success. The usual dose is 3 to 5 c.c. of 1-1000 sterile solution of mercuric chloride. The number of injections required varies. In acute conditions one or two injections may suffice, while chronic cases usually require five or more. In two instances he has seen acute mercurial poisoning after intravenous applications. In one instance the large dose of 2 cgrm. was injected for a severe anthrax, and in the other instance (probably an idiosyncrasy against mercury) very marked symptoms of acute mercurial poisoning appeared after an initial dose of 3 mgrm.

REFERENCE.—*Jour. Amer. Med. Assoc.* 1919, i, 1596.

MORPHINE. (See also ALCOHOLISM AND DRUG ADDICTION, p. 32.)

Bluemel¹ treats **Chronic Morphinism** by elimination methods. The supply of the drug is completely stopped, active catharsis by mercurial and compound cathartic pills is established, and intravenous injection of saline solution is given two or four times daily. The standard infusion consists of 1000 c.c. of 0.9 per cent sodium chloride in freshly-distilled water. The patient is kept in bed, receives a fluid or semi-solid diet, and for the first few nights is given 30 grains chloral hydrate to promote sleep. On an average the infusions require to be kept up about a week. There is more or less acute discomfort at intervals during the first two or three days, but this is relieved by a fresh infusion. After the acute discomfort stage there follows a period of nervousness and sleeplessness. The average stay in hospital was a fortnight.

REFERENCE.—*Jour. Amer. Med. Assoc.* 1919, Feb. 22, 552.

PEPTONE.

Pagnez, Valery, Radot and Hast¹ advise the trial of a cachet containing 0.5 gm. of peptone one hour before meals in **Urticaria** and **Migraine** of gastro-intestinal origin. Many varieties of these disorders are really instances of anaphylaxis. The oral administration of peptone is an adaptation of Besredka's method of avoiding anaphylactic shock by the preliminary use of a fractional dose of the shock-producing substance. They claim good clinical

results from the oral administration of peptone on an empty stomach for a course of ten days. To overcome the hygroscopic properties of the peptone it is given mixed with half its weight of calcined magnesia.

REFERENCE.—¹*Comp. Rend. Soc. de Biolog.* 1919, Feb. 8.

PITUITARY GLAND.

Dalché¹ uses in **Gynæcological Conditions** a dry extract of the whole gland, giving from 2 to 4 cachets daily, each containing 0.1 gm. The treatment requires to be kept up for long periods in chronic conditions, but is satisfactory if persevered with for weeks or months—e.g., in the case of fibromatosis, bleeding fibroma, vaginal metrorrhagia, or intermenstrual dysmenorrhœa. A young girl with profuse or too frequent menstruation is advised to take the extract every day for the first month, then for a week before and during the week of menstruation. He also finds the extract useful in congestions and excessive functioning of ovary or thyroid, and in certain types of headache which show exacerbation at the periods. Further, he finds the extract of some value in controlling the flushing and sweats of the menopause.

REFERENCE.—¹*Rev. Mens. de Gyn. et d'Obst.* 1919, May, 165 (abstr. *Jour. Amer. Med. Assoc.* 1919, ii, 563).

PROTEIN, FOREIGN.

Hermann¹ concludes that intravenous injections of foreign protein serve as a stimulus for the liberation of specific antibodies in animals in which previously injected antigen was unable to cause such a liberation. According to him, the injection of non-specific protein produces an antibody response which is specific to the invading germs. Among those who have used bacterial emulsions as the non-specific protein are Cowie and Beaven,² who injected typhoid vaccine intravenously in **Influenzal Pneumonia**. They give not more than 500 million at one injection, and do not repeat the dose for forty-eight hours. It is not advisable to use this treatment in the presence of myocardial insufficiency or acute endocarditis, but in the early stages of pulmonary complication protein treatment gave good results. Wells³ also records a small series of influenzal pneumonias where intravenous injections of typhoid vaccine gave fairly good results, 7 out of 11 patients recovering. More important is the report of Roberts and Cary,⁴ who used a mixed vaccine containing in each cubic centimetre 100 million each of *B. influenzae*, pneumococci of i, ii, iii types, streptococci, and staphylococci. The initial intravenous dose was 1 c.c., subsequent doses being regulated by reaction. With purely expectant treatment the death-rate was 27 out of 86 cases, or 31.2 per cent; with vaccine treatment, out of 200 cases 19 died, or 9.5 per cent. In about one-third of the vaccine cases the disease ended by crisis.

REFERENCES.—¹*Jour. Infect. Dis.* 1918, Nov., 457; ²*Jour. Amer. Med. Assoc.* 1919, April 19, 1117; ³*Ibid.* June 21, 1813; ⁴*Ibid.* March 29, 922.

SERUM, PNEUMOCOCCAL.

Kahn¹ has used human serum obtained from convalescent influenza and influenzal bronchopneumonia patients in a series of 25 cases of severe **Post-influenzal Pneumonia**. The serum was administered when the patients were acutely toxæmic. The results are fairly good, as the mortality was only 12, whereas out of a similar series of 18 patients without serum the mortality was 12. The administration of the serum was by the intravenous route, and in several cases surprisingly beneficial results followed. The convalescent patients were bled to 300 to 400 c.c., and the blood was kept in the refrigerator for twelve hours, when the serum was decanted, tested for Wassermann reaction,

mixed with the serum of two or three other donors, and administered in doses of 100 c.c.

A more extensive experience of the use of pooled serum of convalescent cases of influenzal bronchopneumonia in the treatment of similar acute cases has fallen to the lot of McQuire and Redden,² who refer to 151 cases thus treated. They state definitely that the use of pooled serum has greatly reduced the mortality, shortened the course of the disease, and proved almost a specific. Most of the patients were treated early in the disease. As a rule about two doses were sufficient, the average dose being 120 c.c. The total mortality was 4 per cent. Of 138 recoveries, 83 terminated by crisis, 55 by lysis, and in over half the cases the temperature became normal within forty-eight hours of commencing serum treatment.

Litchfield³ reports 10 cases of **Pneumococcic Meningitis** treated with intraspinal and intravenous injection of Kye's serum. Of the 10 cases, 5 recovered.

McClellan¹ also gives favourable accounts of the same polyvalent serum in a series of 322 cases of **Pneumonia**. The death-rate, 7.7 per cent, was low, and the serum seemed to relieve toxæmia, to reduce the general level of the temperature, and to lessen the pulse-rate. A large number of cases treated ended by crisis on or before the fourth day. For the most part the serum was used intravenously in doses of 2.5 c.c. once or twice daily. The first batch of serum tended to produce a marked febrile reaction with chill, but the later batches did not produce this disturbing action.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Jan. 11, 102; ²*Ibid.* March 8, 709; ³*Ibid.* May 10, 1345; ⁴*Ibid.* June 28, 1884.

SODIUM BICARBONATE.

Harrop¹ records a case of a woman suffering from anuria resulting from swallowing corrosive sublimate, in whom the intravenous injection of sodium bicarbonate produced, or at least precipitated, an attack of **Tetany**. The previous day 500 c.c. of a 5 per cent solution of sodium bicarbonate had been well borne, but the second injection of 700 c.c. twenty-four hours after brought on tetany within five minutes. Examination of the blood serum showed that the calcium content was not abnormally low, nor was the phosphate content abnormally high. He calls attention to the possible danger of administering sodium bicarbonate intravenously when the renal excretory function is markedly impaired, particularly when extreme oliguria or anuria is present.

REFERENCE.—¹*Johns Hop. Hosp. Bull.* 1919, March, 62.

UROTROPINE. (See HEXAMETHYLENETETRAMINE.)

VACCINES, DETOXICATED.

Thomson¹ claims to have devised a method of detoxicating vaccines which permits the injection of much larger amounts. He states that removal of the toxins does not alter the specific antigenic properties of the vaccines. Thus, by injection of quantities of detoxicated vaccine, from ten to one hundred times greater than that of ordinary vaccine, he obtains a greater immunity. His research started from the observation that many Gram-negative germs readily autolyze in weak alkaline solutions. Neutralization with acid throws down a precipitate which consists chiefly of the stroma of the germs. The neutralized supernatant fluid is strongly toxic, producing a marked local reaction when injected. The precipitated stroma is much less toxic, and produces no local disturbance on injection, but in suitable doses causes a marked production of antibodies. The simplest method of producing his detoxicated

vaccines consists in washing the precipitated stroma repeatedly with a weak acid solution such as 0.5 per cent acid sodium phosphate containing 0.5 per cent phenol. The vaccine is given as a suspension in this fluid. Injected subcutaneously in **Gonorrhœal cases**, there may be a negative phase lasting twenty hours, followed by a gradual development of antibodies in the next seven to fourteen days. The vaccine should be given every third or fifth day. The curative action is gradual but progressive, and as a high immunity is established, relapses are infrequent.

Lees² sums up his clinical experiences with detoxicated vaccine in gonorrhœa as follows. Detoxicated vaccine, either in the form of a solution or precipitate of gonococcus stroma, minus its toxin, provokes a specific reaction, with rapid production of a specific antibody, when given in sufficient dose. Even in doses of from 2500 to 10,000 no negative phase was seen. It is practically non-toxic, and much more effective in producing great and rapid specific reaction than any other form of vaccine. All cases treated with vaccine should be treated locally as a surgical condition, the vaccine being used as a valuable adjunct, and its dosage regulated by the serological results and the bacteriological process of the disease. Vaccine-treated cases run a milder course, with an absence of complications and less tendency to relapse.

REFERENCES.—¹*Lancet*, 1919, ii, 1102; ²*Ibid.* 1107.

VIBURNUM PRUNIFOLIUM.

Hager and Hecht,¹ from investigation of the action of *viburnum prunifolium* on the uterus, conclude that it has little action in modifying the uterine contractions. The action is not very decided, and is not reliable.

REFERENCE.—¹*Jour. Pharmacol. and Exp. Therap.* 1919, xiii, 61 (abstr. *Surg. Gyn. and Obst.* 1919, Aug., 122).

XYLOL.

Bory¹ finds that xylol is very useful in dermatological practice. It is a good solvent for fats, very diffusible, and a good antiseptic. Thus a very satisfactory iodine preparation is made by dissolving 1 gm. iodine in 15 to 20 c.c. xylol, and adding it drop by drop to enough vaseline to make 100 gm. This is an excellent remedy for **Pubic Lice**. A single application is usually sufficient. Indeed, for **Slight Infections of the Skin** he claims that one or two applications of this ointment are curative. A similar preparation containing 2½ per cent of iodoform in vaseline can easily be made by the aid of xylol. Made with liquid paraffin instead of vaseline, these preparations are useful as tampons in **Gonorrhœal Infection of the Uterine Cervix**. But perhaps the main action he desires to introduce is that of efficient **Prophylaxis against Venereal Infection**. The xylol-iodine ointment may be used, or crayon, or stiff pomade—e.g., iodine 3 gm., xylol 15 gm., wax 32 gm., olive oil 50 gm.; or calomel 38 gm., xylol 12 gm., wax 16 gm., olive oil 20 gm. In military practice, such applications before coitus, followed after coitus with renewed application after thorough washing, have proved effectual in diminishing the number of infections.

REFERENCE.—¹*Presse Méd.* 1919, Feb. 10, 87.

RADIOGRAPHY, RADIO-ACTIVITY, AND ELECTRO-THERAPEUTICS.

BY

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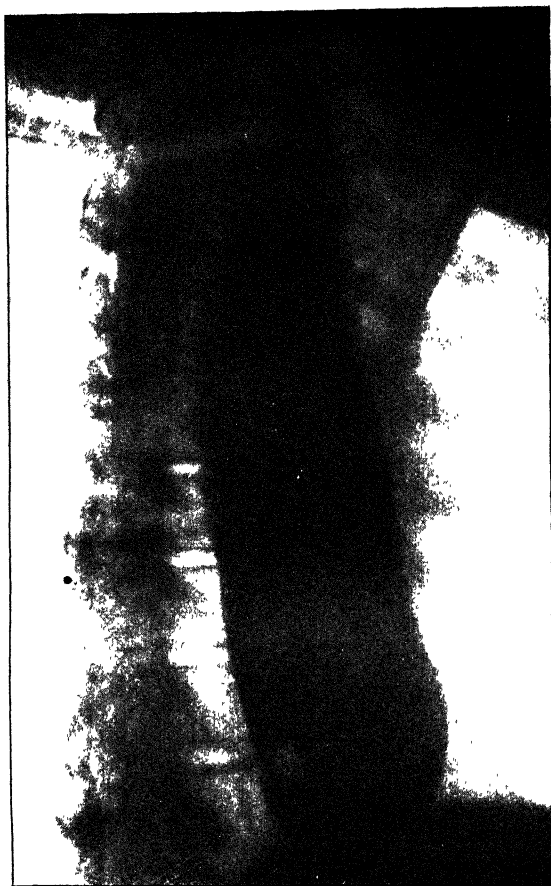
X-RAY EXAMINATION OF THE ALIMENTARY TRACT BY MEANS OF THE BARIUM MEAL.

X-ray work may be said to be still in its infancy. It is as recently as December of 1895 that x rays were discovered; it is only in the past ten or twelve years that their value in the examination of the alimentary tract has been gradually substantiated. Cannon, of the United States, in 1898 had experimented with bismuth food in animals, had given large doses, and had shown that such meals were opaque to x rays. In 1899, Williams, of Boston, and Cannon, mixed 1 oz. of subnitrate of bismuth into a pint of bread and milk, and watched this through the stomach and bowels in three cases, making diagrams and taking plates. These are the first recorded cases examined by this method. Reider, to whom the credit of discovery of the bismuth meal is generally given, did not publish his work until 1904. It is obvious that he is not entitled to priority, but at the same time he was the first to endeavour to establish the value of the bismuth meal on a firm footing. Since then this method of examination has advanced by leaps and bounds, and at the present time there can be no doubt but that a well-conducted x -ray examination of the gastro-intestinal tract is of paramount importance in every case of so-called 'indigestion'. It alone can often make an accurate diagnosis without any aid whatever either from the history of the case or from any other method of examination. It alone, even if it does not actually diagnose, can furnish certain facts unobtainable by any other means. It is not too much to say that to-day no physician or surgeon can afford to do without an x -ray examination in any case in which the symptoms suggest that the œsophagus, stomach, or bowel is at fault, with the exception of those cases in which the condition and symptoms are so urgent as to need an immediate emergency operation, or in which the diagnosis is so clear as to be beyond any possible chance of error.

It is somewhat unfortunate that a really complete examination of all these cases by means of x rays is almost impossible as a routine either in hospital or in private practice. Expense and time almost prohibit this being done. The ideal to aim at could only be carried out by: (1) Plates being taken of the gall-bladder area; (2) Watching the passage of the food through the œsophagus and the manner in which the stomach fills up on the screen; (3) Making a special observation and plates of the duodenum; (4) Plates and a screen examination of the stomach itself immediately, an hour or two, and six hours after the taking of the meal; (5) 8-, 24-, 48-hour, and in some instances even longer, screen and plate observations of the appendix region and of the large bowel; (6) In bowel cases, the further injection of a test barium enema. In an ordinary private x -ray clinic, such extensive examina-

PLATE I.

CARDIOSPASM



Esophagus full of opaque test food.

C. Thurston Holland

PLATE II.

X-RAY EXAMINATION OF THE ALIMENTARY TRACT

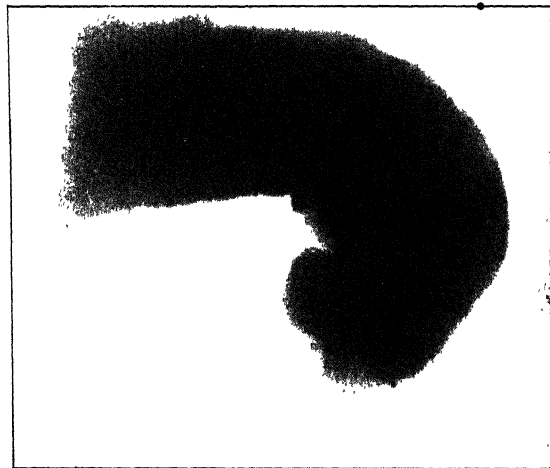


Fig. A.—Stomach Uter.

MEDICAL ANNALS, 1920



Fig. B.—Leather-bottle stomach.

C. Thorstao Holland

tions are possible only in a comparatively few cases, and examinations have to be modified and guided by the salient symptoms more or less to certain parts. In ordinary general hospitals, the amount of *x*-ray work is such that if all these cases had to be examined with the above detail, a special *x*-ray department would be necessary for them alone. However, even with the limitations enforced by ordinary, everyday work, it still remains that more correct diagnoses in these conditions can be made by intelligent *x*-ray investigation than by any other means of examination.

The Œsophagus.—Apart altogether from the question of the demonstration of the presence of swallowed foreign bodies arrested in this organ, it is possible to demonstrate, and to differentiate, strictures, pouches, cardiospasm, dilatation, and other rarer conditions, with ease and accuracy. If test food passes down the whole length of the œsophagus and into the stomach without the slightest suggestion of any abnormality, it is practically safe to exclude any pathological condition. The exact site of any lesion is shown with accuracy. The *x*-ray examination taken quite alone has certain limitations. It will not necessarily differentiate a stricture due to malignant disease from one caused by syphilis. On the other hand, it is not seldom very dramatic. I remember the case of a male adult who came to me on his own account—that is, not sent by a doctor—because the last surgeon he had consulted proposed to do a gastro-enterostomy on him. The history given was, in its salient features, one of fifteen years' symptoms, during which time he had consulted all the doctors he could find, and taken all the medicines which could be prescribed. Every-one of them had told him that his stomach was at fault. The *x*-ray examination showed an œsophagus which could be filled up with a pint or more of opaque food, none of which could be seen to enter the stomach. It was a typical advanced case of **Cardiospasm** (*Plate I*). This condition has been shown by *x* rays to be much more common than was known; the diagnosis is one which offers no difficulties. A further use of radiology is that in dilating these strictures, etc., it is possible to make sure that the bougie really does pass through into the stomach. In the majority of instances it has been shown that this is not the case, and that the bougie curls up in the dilated œsophagus.

The Stomach.—It is not too much to say that the *x*-ray examination of the stomach by means of the opaque meal has gone far to revolutionize our former ideas as to its position and shape, and also as to its behaviour towards the food put into it. It has done more than this: it has demonstrated in no uncertain manner that our pre-*x*-ray ideas as to what could be done by percussion and auscultation were entirely fallacious, and that we were not able to do that which we professed to do.

At the present time the position is that, given a stomach which is entirely *x*-ray normal in every respect—shape, size, position, tone, contractions, pyloric-end rhythm and shape, and normal emptying—one in which there is not the slightest *x*-ray suggestion of anything wrong—it is practically safe to exclude the stomach as the primary cause of any symptoms which may be present.

In a large number of pathological stomachs, ulcers (*Plate II, Fig. A*) and ulcer cavities can be shown beyond doubt; probably by the time that primary malignant disease of the stomach has given rise to symptoms which send the case to a medical man, it has given rise to alterations which can be demonstrated by *x* rays; pyloric stenosis can easily be detected even in its early stages before atonic dilatation has occurred, and when the musculature of the organ can still overcome the stenosis, as well as in the later stages in which we find the enormous atonic dilated stomach from which little or no food can pass, and only liquids with difficulty.

The condition known as hour-glass contraction, an occasional clinical diagnosis before *x*-ray interference, has been shown to be a common condition in cases of chronic indigestion. This condition is usually due to the contractions of scar tissue set up by an ulcer on the lesser curvature, but a case is occasionally met with which suggests the possibility of congenital origin. We have had about 200 cases of all types, and these have led to the following observations: (1) That genuine hour-glass stomach in males is very rare; (2) That it is very common in women at all ages, and only very exceptionally is it due to, or associated with, malignant disease of the stomach; (3) That the symptoms it gives rise to, and the history given by the patient, cannot be distinguished, in the large majority of cases, from those due to an ulcer at the pylorus giving rise to gradually increasing pyloric stenosis.

Many of the rarer stomach conditions, such as hair-ball, benign tumours springing from the wall of the stomach, diaphragmatic hernia (*see Plate III*), congenital pyloric stenosis, etc., can all be shown by radiography, and in many such conditions and cases it is the *x*-ray examination which finally decides the question of diagnosis.

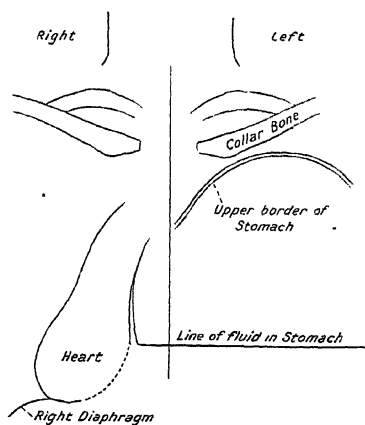
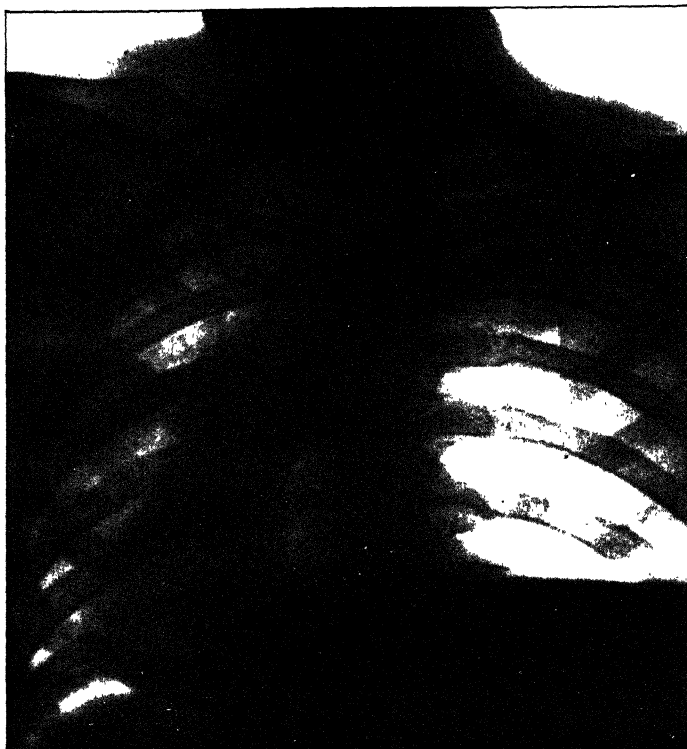
The question is often asked as to whether it is possible to differentiate simple from malignant ulcer by means of an *x*-ray examination. The direct answer to this question would have to be in the negative; but this negative answer requires considerable modification. In hour-glass contraction, experience has shown that, however long the history—and it not infrequently reaches forty years—it is almost certain that the ulcer is simple. Out of some 200 cases—most of which have been operated upon—I only remember one in which the surgeon reported unmistakable and extensive malignant disease, and the after-history of this case is not known. I know of several in which, at the operation, the surgeon felt sure that it was malignant, yet all these lived long enough to prove that this was not the case. I am not a believer in the theory that a chronic gastric ulcer is likely to give rise to malignant disease, or that malignant disease is necessarily preceded by a simple ulcer. The rarity of malignant disease of the stomach in women as compared with men (as seen in the *x*-ray department), and the facts that chronic gastric ulcers are far more common in women than in men, and that the perforating type on the lesser curvature giving rise later to the hour-glass condition—a most irritating type of ulcer—is seen so frequently in women and is almost always simple, are points in favour of this contention. In addition, those cases of pyloric stenosis giving a history extending over many years, and which on *x*-ray examination show a huge, dilated, completely atonic stomach, with its lower border down to the symphysis pubis, and in which the stenosis is due to contractions of scar tissue plus chronic inflammatory changes set up by the long-standing ulcer, are rarely malignant. Occasionally—and I emphasize this ‘occasionally’—one of these cases on operation turns out to be malignant—malignant in the sense that recent malignant disease has supervened on the old simple ulcer; but this is quite the exception.

In all these cases the *x*-ray examination determines the point that operation is justifiable and necessary, and proves beyond any shadow of a doubt that medical treatment, dieting, etc., are mere camouflage; it is a pity that so many are allowed to drift on and on, taking one medicine after another, one diet after another, when an earlier *x*-ray examination would prove the inutility of such methods of warfare.

Apart from the occasional supervention of malignant disease on an old ulcer, the history given by cases of cancer of the stomach is usually altogether different. The larger number seen in the *x*-ray department are males. They give a short history—often a few months only. Very often, one might say usually, they

PLATE III.

DIAPHRAGMATIC HERNIA OF THE STOMACH



have never had any indigestion in their lives until this attack. The *x*-ray examination, as a rule, shows a stomach which has not been altered much in size; but frequently there is an extensive alteration in the shape of the pyloric end and its neighbourhood, according to the amount infiltrated with growth. In these cases the short history, and the age of the patient are of assistance in arriving at a correct diagnosis, but in very many of them the *x*-ray appearances alone are quite sufficient. Other cases are those in which the age and history of the patient are suggestive, and yet no very definite *x*-ray abnormality in shape can be detected, but which show very exaggerated contractions associated with a slow emptying; this would be very suspicious; also a stomach, with the same history, in which the contractions are absent from the pyloric end, and from which the food appears to flow, should also be viewed with suspicion.

The true 'leather-bottle' stomach (*Plate II, Fig. B*) presents a very characteristic *x*-ray appearance. In an advanced case of this kind practically the whole organ is reduced in size to a narrow tube. There are no contractions, and the food passes into and through the duodenum as fast as it enters from the oesophagus. In less advanced cases, whilst most of the stomach is reduced to the tubular form, the cardiac end may still be more or less normal-looking, and form a kind of food reservoir.

Apart from the value of radiography in the diagnosis of all these conditions, it is often of value in deciding the question of operation—exploratory or otherwise. In the leather-bottle type, and in many of malignant disease, it is often made obvious that an operation with a view to a gastro-enterostomy is useless and should not be performed. In other cases it is clearly indicated that there is plenty of room for such an operation.

Whether it is possible by means of *x* rays to make an earlier diagnosis of cancer, and so point the way to earlier operation, is problematical. Probably by the time that these cases have symptoms which send them for advice, and by the time they get to an *x*-ray department, the disease has made so much progress that radical cure is out of the question.

The Duodenum.—It should be remembered that nine-tenths of duodenal ulcers occur in the first inch and a half, and usually on the anterior wall; the remaining one-tenth anywhere in the rest of the duodenum. Radiography furnishes either 'direct' or 'indirect' signs, the former being the more reliable. If, on the screen, or on plates, a definite deformity of the first part (the cap) of the duodenum can be demonstrated, then this is strong evidence of an ulcer. The deformity should of course be constant. It is not absolutely diagnostic, inasmuch as other pathological conditions—adhesions, gall-bladder trouble, etc.—may be the cause. If, on the other hand, at any single examination the filled duodenal cap presents a perfectly normal *x*-ray appearance, this should in the large majority of cases negative the presence of an ulcer of this part. The indirect signs are tenderness over the duodenum, spasm, alteration in gastric tone, motility, and peristalsis. The value of these signs is questionable. Increased peristalsis and motility of the stomach are perhaps the most reliable, especially if associated with rapidity of emptying; on the other hand, a duodenal ulcer may have gone to the stage of producing obstruction, and then there would be delay in emptying. It should also be remembered that gall-bladder trouble may be the cause of such stomach signs; also the appendix, and also bad teeth. There is no doubt that in the diagnosis of duodenal ulcer the clinical history is of the utmost value, and it is not safe to make the diagnosis on *x*-ray evidence alone.

In a summary of the value of *x*-ray work in stomach conditions, it is impossible to omit altogether the question of *gall-stones*. These are not infrequently

found during the routine of making a test-meal examination, and they not uncommonly give rise to symptoms which suggest that the site of the trouble is the stomach. A more certain way to show them is to expose two or three plates on the right abdomen with the patient lying face down; but, as already stated, this is not feasible as a definite routine. Gall-stones cast radiographic shadows in direct ratio to the amount of bilirubin and calcium salts they contain, whilst pure cholesterol stones cannot be shown at all, as they are completely transparent to *x* rays. Even when shadows are shown, the differential diagnosis is often very difficult. Ring-like shadows in the right abdomen, with the centres more or less transparent, are very characteristic of gall-stones. Gall-stones can often be shown on plates taken both face down and lying on the back: they show, invariably, a smaller and sharper shadow on the face-down plate. It is not possible to give with accuracy the percentage of the cases in which they can be shown; but in expert hands, and with the highest class of technique, probably if all cases were examined in which they were actually present, they would be shown in about 40 per cent.

The Small Bowel.—Very occasionally an obstruction of the jejunum can be detected and shown by radiography. With this exception this part of the alimentary tract does not lend itself to *x*-ray observation.

The Large Bowel.—This allows of two methods of examination: (1) By the swallowed test meal; (2) By the opaque injection. Abnormalities of shape, size, and position can all be demonstrated. In stricture of the colon—as a rule due to malignant disease—a barium enema will usually give more definite evidence than the swallowed meal; the injection should be watched on the screen. A point of diagnostic value is sometimes present before any test food is given. If the patient is examined by the screen—standing up—all over the abdomen may be found loops of distended bowel containing fluid with gas above the fluid. These are easy to recognize, and on shaking the patient the fluid ripples below the gas. The presence of loops of this kind always means bowel obstruction, and usually malignant obstruction.

The Appendix.—This can as a rule be demonstrated by opaque food if a proper technique is observed, and if—a somewhat important point—there is no limitation to the number of times screen observations can be made. There is a considerable difference of opinion as to the actual value of radiographic findings in making the diagnosis of a healthy from an unhealthy appendix. Further, it is a condition in which probably no reliability can be placed upon the *x*-ray examination alone; but when certain *x*-ray findings—tenderness definitely over the visualized appendix, fixation, abnormal position, abnormal food appearances—coincide with symptoms, then, and then only, can they be said to aid in the diagnosis. As showing the difficulties, I remember a case in which a segmented food shadow remained over a period of several days, even after the ascending colon had emptied; there was tenderness on pressure directly on the appendix shadow; the appendix appeared to be fixed; it was certainly abnormally large. An operation was undertaken, more or less on the *x*-ray findings. A normal but rather long appendix was found and removed. It was not even adherent. (*See also APPENDICITIS; CHRONIC.*)

Gastroptosis and Enteroptosis.—There are a great many other conditions besides those already mentioned, in which an *x*-ray examination is of the utmost value. Gastroptosis and enteroptosis are both easily demonstrable, but some care has to be used with regard to them. A stomach, for instance, in the standing position, may have its lower border, after a meal, far below the level of the iliac crest line without there being anything abnormal. In the examination of a large number of cases, one often meets with those in which the space between the arch of the diaphragm and the iliac crest is very short indeed, and in such

cases a normal stomach may simulate—in the position of its lower border—one in which there is definitely gastropnoxis. Care must also be used in the consideration of those cases in which the transverse colon is looped right down into the pelvis. They are not necessarily abnormal. The very large number of these cases which one meets with in making *x*-ray examinations suggests that in the majority the condition is congenital, and not acquired, and that a more or less straight transverse colon extending across the abdomen from the hepatic to the splenic flexure is not necessarily the only normal one.

Constipation.—Here the *x*-ray examination is all-important. It, and it alone, shows where the delay occurs; whether there is definite delay in the last coils of ileum; whether the delay is definite in any part, or the whole, of the large bowel; whether the delay is merely one of incapacity to empty the rectum. It is unnecessary in a review of this kind to enter into any discussion on the different theories connected with intestinal stasis. The *x*-ray findings are facts, but their true interpretation or otherwise will depend largely on individual bias. Apart altogether from accepting Lane's theories and Jordan's interpretations, the work of both has stimulated surgeons, physicians, and radiologists in no small degree.

Other Conditions.—While the foregoing deals shortly with each of the more important points in *x*-ray diagnosis of the conditions of the gastro-intestinal tract, there still remain many other conditions in which such an examination may be either conclusive or helpful. In diverticulitis, colitis, tuberculous lesions of the colon, transposition of viscera, Hirschsprung's disease, and many rarer conditions, such an examination is often absolutely diagnostic, and it is always helpful. To go a step further: the negative *x*-ray evidence is not to be overlooked. In a great many cases the negative evidence will rule out altogether a large number of possibilities which the symptoms, etc., suggest, and rule them out in no uncertain manner.

To sum up: There is practically no condition of disease of the gastro-intestinal tract in which a careful *x*-ray examination conducted by an expert has not great possibilities. In a very large number of the cases it is possible by an *x*-ray examination alone—without any assistance from the history of the case or any other method of examination—to make a complete and final diagnosis. In a still larger number of the cases the *x*-ray evidence, plus the history, etc., will make the uncertain diagnosis a certain one. In no single case can it be said that the *x*-ray evidence is not of some definite value.

X-RAY DIAGNOSIS.

Œsophagus.—So-called 'Cardiospasm', from the *x*-ray point of view, is an exceedingly common affection. It is met with in all forms, from a slight arrest of food at, or close to, the cardiac end of the Œsophagus, and with merely a filling up and no great dilatation, to an enormously dilated organ with marked hypertrophy of its walls. Boulanger and Digne¹ publish a case of the latter description, and give a detailed account of the radioscopic examination and appearances. They point out that in these advanced conditions, where the whole thoracic portion is dilated, the Œsophagus cannot be completely filled with the test food owing to the fact that when it is about half filled the patient cannot tolerate any more food. It is to be noted that in such a case the lower Œsophagus curves well over to the right, and the shape of the food shadow in this lower portion appears very like that seen when the food drops to the bottom of a large, dilated, atonic stomach. Those interested in this subject should refer to Hill's paper on "Dilatation of the Œsophagus without Anatomical Stenosis".² In this paper, and the discussion following upon it, the

symptomatology, etiology, and pathology are all reviewed, in addition to the radiological findings, etc. Many post-mortem appearances are illustrated, and these are of use, as they go far towards explaining the differences seen in the *x*-ray pictures of different cases.

Gerber³ relates a case of **Œsophago-tracheal Fistula** associated with a diverticulum, in which syphilis was suggested as the probable cause. The filling up of the trachea and bronchi with the swallowed barium food is shown in two good radiographs. The paper concludes with a review of the somewhat scanty *x*-ray literature on this subject.

Guthrie's⁴ paper on "Some Cases of **Foreign Body** in the Air and Food Passages" contains many references to *x*-ray findings. He points out that whereas small pieces of bone cannot often be actually shown by *x* rays, their presence in the œsophagus can frequently be determined by the behaviour of swallowed mouthfuls of barium food.

Gastro-intestinal Tract.—

Methods of X-ray Examination.—Stein and Stewart⁵ advocate the *x*-ray examination of the abdominal organs following oxygen inflation of the peritoneal cavity. They review the work already done in this manner, the most important papers being by Rautenberg⁶ and Goetze.⁷ The latter used the method in over 90 cases, and his illustrations show remarkable results in a large and varied number of pathological conditions. The procedure is as follows: The patient is prepared in the usual manner for an *x*-ray examination, and is placed flat upon his back. The apparatus required is an oxygen tank, a rubber bag to hold about one gallon of oxygen, and a rubber tube to which an ordinary lumbar-puncture needle can be attached. A point $1\frac{1}{2}$ in. below and 2 in. to the left of the umbilicus is sterilized with iodine and anæsthetized with an injection of novocain-adrenalin solution. The puncture needle is then inserted slowly through the abdominal wall, and the rubber tube connected up. A slight pressure on the oxygen bag introduces the oxygen into the peritoneal cavity, and four to five minutes suffices to inject a gallon. After the examination the gas is not removed, as it absorbs without trouble in about twenty-four hours. The gas is non-irritating to the peritoneum and the abdominal organs, and no bad effects have been noticed. The patient is examined in from two to three hours after the inflation, and this permits of the examination being made in any or all positions. All the solid organs are revealed with a clearness and distinctness hitherto impossible to attain; the authors consider that the procedure promises a wide extension of the diagnostic scope of *x* rays in the domain of gynæcological and general abdominal surgery. It is not a competitor with the opaque-meal method, as this concerns the hollow organs, whereas the newer method is concerned with the parenchymatous abdominal organs. It can be used in combination with the barium meal. Reference should be made to the paper for numerous remarkable illustrations showing the spleen, liver, kidneys, gall-bladder, intraperitoneal adhesions, uterus, fibroids, and so on.

Einhorn⁸ has attempted to visualize the whole length of the intestines by means of a 'delineator' of his own invention. He has had made a string, 30 feet in length, consisting of braided silk, through the lumen of which run 60 strands of annealed copper; the string is marked in a manner which allows of lengths being read off from a metallic ball fixed to its end. The ball is swallowed with a light breakfast, and it passes through the gut dragging the string behind it, precautions being taken to regulate the rate at which it travels. String and ball throw shadows on plates, exposed at frequent intervals. The paper is illustrated with a series of these radiographs. As far as can be gathered from the paper, no attempt has yet been made to use this instrument in diagnosis.

of any pathological condition, and the only points made by its inventor are (1) that the ball, in the small bowel, always runs ahead of the string, and (2) that in the large bowel, loops of the string are seen in front of the ball. It is suggested that in obstruction in the small bowel the ball should be held up, and the string should curl up.

[We call attention to these two papers, but hardly think that either method of examination is one which will appeal to British radiographers. In very exceptional cases it is possible that the first method might be of some help; but the second method is, on its face, one which, however ingenious, does not appear to fulfil any useful purpose.—C. T. H.]

Foreign Bodies in the Stomach are common enough, but a remarkable case is reported by Hill and Lees,⁹ in which a whole fork was accidentally swallowed by a woman who was using it in an attempt to dislodge some food stuck in her throat. It is of interest to note that the hospital authorities did not appear to believe her, and she was not radiographed until two days after she applied to the hospital. The radiograph showed the fork lying with the handle at the pylorus and the prongs in the cardiac end.

Holmes¹⁰ reports two cases of **Pedunculated Malignant Growths of the Stomach**, in one of which a definite diagnosis was made on the *x*-ray findings alone, before operation. This condition is a rare one, and pedunculated growths are usually benign. Basch¹¹ reports three cases, with a complete description of the *x*-ray findings: all showed large circular filling defects; two other cases with *x*-ray reports are furnished by Myer.¹² In the present paper the author draws attention to the fact that in both cases the screen examination showed that peristaltic waves passed over the involved area of the stomach without evidence of break, such as is seen in lesions which involve the gastric wall. This fact, in conjunction with a filling defect, appears to be the *x*-ray diagnostic point.

Diaphragmatic Hernia of the Stomach (Plate III) has been observed in numerous cases as a result of war injuries. Aimé and Solomon¹³ attribute this to the large number of cases in which there has been an injury to the diaphragm. They describe three cases in detail, the illustrations being drawings from *x*-ray plates which are instructive. The actual diaphragm on the left side is not seen in this condition, but after a test meal the food shadow is seen to be constricted at the level at which it should be. Above this level, and extending high up into the thorax, is the upper part of the stomach, containing food below an enormous gas-bubble. The radiographic diagnosis of the condition is made with certainty when a supradiaphragmatic pouch is seen which dilates with an effervescing mixture, or fills with an opaque meal. Examinations in the horizontal and lateral positions are of importance, and supply useful information.

Visceroptosis.—Ansell¹⁴ agrees that there are four major groups of bodily physique, and that the majority of individuals can be placed in one or the other of these groups. They are the hypersthenic, sthenic, hyposthenic, and asthenic. Each group shows certain characteristic proportional dimensions of the thorax and abdomen. Definite types of visceral form, position, and tonus are fairly constant in each group. Ansell's paper discusses these groupings from the point of view of gastroptosis and intestinal ptosis. These conditions are found rarely in the first two groups, more frequently in the third, and commonly in the fourth. It is pointed out that the stomach may be of fairly good position and tone, and nevertheless the colon may show a pronounced condition of prolapse; it is therefore always necessary to make the complete examination. A further point is that in cases of gastroptosis a six-hour residue, especially if large, should always be viewed with suspicion, and a careful search should be made for *x*-ray evidence of ulcer at or near the pylorus.

Ulcer.—Baetjer and Friedenwald¹⁵ publish a very comprehensive paper based on the study of 743 cases in which the *x*-ray examination was made independently, and with no knowledge of the clinical findings, etc., and a report made from the *x*-ray findings alone. The two reports were then placed side by side and compared. Out of 185 cases operated upon, and in which an ulcer was found, the *x*-ray findings were verified in 147. In the remaining 38 cases the *x*-ray findings were either not characteristic or pointed to other conditions. The authors discuss the findings in the other cases, and group 323 of them as gastric ulcer, both clinically and from the *x*-ray point of view. In the remainder, very doubtful clinically, the *x*-ray findings were definite in 235. In considering the value of the *x*-ray evidence, and the points the authors rely upon, it is stated that the presence of a single duodenal ulcer can be ruled out, but that a gastric ulcer cannot be. The reasons for this are explained. Great emphasis is laid upon the motility of the stomach and duodenum, the nature of the contractions, and the manner in which the food passes through the pylorus and duodenum, and the rate of emptying of the stomach. It is admitted that great difficulties arise in cases complicated by adhesions, and in those in which inflammation of other abdominal organs is present.

Brasch¹⁶ discusses the differential diagnosis between chronic gastric ulcer and carcinoma of the stomach, and states that in the present state of our knowledge there is no absolute test for either carcinoma or ulcer. The *x*-ray evidence is not considered to be entirely reliable in cancer, as after an *x*-ray examination had shown no sign of the presence of a growth, operation had proved that carcinoma was present. A series of illustrative cases is detailed, and in the differential diagnosis of the two conditions the writer places methods in the order of importance as follows: In chronic ulcer history, *x*-ray examination, objective examination, laboratory findings; in advanced cancer history, laboratory findings, objective examination, *x*-ray examination.

Gastro-enterostomy Results.—Moynihan's¹⁷ lecture on "Disappointments after Gastro-enterostomy" is one which should be carefully considered by all radiologists. It is a frequent occurrence in both hospital and private work to be asked to examine cases in which such an operation has been performed, and to report as to why the operation is not a success. Probably every *x*-ray worker has asked himself the question, "Is a gastro-enterostomy for duodenal ulcer the great success the surgeons claim it to be?" The answer to this question is to be found in this lecture. Many of these cases report themselves as having had a short circuit done for a duodenal ulcer; often at the *x*-ray examination nothing can be definitely found to show why the patient still has pain; the suggestion is that it is quite possible that a considerable number never had a duodenal ulcer at all. It behoves the radiologist in considering these cases to make sure, if possible, what really was found at the operation. The paper is full of the most valuable hints and suggestions as regards the *x*-ray findings, and their proper interpretation. The operation itself is dealt with, and nine 'defects in technique' clearly indicate what the possibilities of an *x*-ray examination are in detecting these defects. In summing up, it is stated that whilst the clinical diagnosis of a duodenal ulcer is rarely difficult, the diagnosis of a gastric ulcer is never easy; that there is only one unequivocal method of diagnosis in cases of gastric ulcer, and that is by the *x*-ray examination; the clinical symptoms are very treacherous. Manson Fergusson¹⁸ writes on the same subject. He agrees that a gastro-enterostomy is frequently performed in unsuitable cases, and without relief to patients; he says that no patient should be subjected to such an operation until he has been thoroughly *x*-rayed by an expert radiographer, and that since he has followed this advice he has seen nothing but good follow those gastro-enterostomies which he has performed.

The Gall-bladder.—In a consideration of gastro-intestinal conditions it is necessary to include the gall-bladder. Macleod's¹⁹ remarks upon his methods and his results, in the radiography of gall-stones and the gall-bladder, are especially worthy of attention, in view of the fact that his exposures range from 30 to 40 seconds, and that he makes no attempt to restrict the movements of respiration otherwise than by compression. If he finds on a single plate any shadow in the slightest degree suspicious or doubtful, he resorts to stereoscopic plates made with a compressor which does not require to be moved for the two exposures. The analysis of his cases is instructive as to what can be accomplished by these methods. In one series of 77 cases examined, he obtained positive results in 39, and gall-stones were found by operation in 20 out of 21 operated upon. In another successful series he was able to demonstrate the gall-bladder itself without stones in 3 cases; in no case operated upon were stones found which were not shown by radiographs. At the same time the author does not, of course, claim that all gall-stones can be shown.

Knox²⁰ begins a comprehensive paper on the whole question of the **Liver, Gall-bladder, and Bile-ducts** from the *x*-ray standpoint. This promises to be a complete monograph on the whole subject. He starts by dealing with the literature—somewhat meagre,—the anatomical considerations, and the pathology of the gall-stones themselves. He follows this with a record of new experimental work carried out with a view to testing the opaqueness of the various constituents of stones and their comparison with the tissues in which they occur; he also gives experiments and photographic records of gall and kidney-stones to show the variation in density with tubes of different vacuum. After further experimental details, the technique necessary for the examination by *x* rays of the gall-bladder area is described in detail, and this part is profusely illustrated with stereoscopic and other photographs. Differential diagnosis from conditions which might cause confusion completes this part.

The Appendix.—The paper by Spriggs²¹ on the examination of the vermiform appendix by *x* rays gives, in addition to a large amount of other material, a complete account of the exact technique to be followed. This is of great importance, as whilst in the first hundred or two cases examined the appendix was seen only a few times, in the last hundred it was seen and plotted 86 times. The chief points about the technique are the clearing out by castor oil thirty-six hours before the test meal, and the preparation of this meal—barium and buttermilk. Some practical hints on how to get the appendix into the *x*-ray field are useful, and it is stated that the best view is usually obtained in from twelve to fourteen hours after the meal. The chief points to be observed are the filling and emptying of the appendix, its shape, motility, position, the presence of concretions, hyperactivity, spasm, or tenderness. Each point is discussed as to its bearings on the diagnosis. Many very fine radiographs are used for illustrative purposes, in addition to photographs and diagrams. Details are given of 36 cases in which the *x*-ray reports are compared with the operative findings. In all these the *x*-ray diagnosis was verified at the operation. Pfahler²² also deals with the same subject, pointing out that whilst in the great majority of cases *x* rays are not necessary for diagnosis, still in obscure cases they will give great assistance. He lays great emphasis, in these obscure cases, on the necessity for a very complete examination, the symptoms being so variable that it is always necessary to examine the entire gastro-intestinal tract, the gall-bladder, and even the urinary tract. His technique and test meal do not markedly differ from those used by Spriggs, but he considers that the 24-hour interval is the best one for catching the appendix. His opinion is that the most valuable sign is the localized tenderness traced to the visualized appendix, and for palpation recommends a wooden spoon with

a metal rim. These two papers taken together give a fair account of the x -ray position as regards the appendix, and a study of them will be found valuable as to a satisfactory technique.

Antiperistalsis of the Colon.—This interesting phenomenon is discussed in its various aspects by Lignac,²³ who considers that it occurs in the first half of the transverse colon, originating midway between the hepatic flexure and the middle of the transverse colon. It is physiological to a certain degree, and can be observed in 50 per cent of cases when examined with the fluoroscope. It has been suggested that the explanation of its occurrence is that it is to maintain the food in this part of the bowel for the purpose of absorption. Pathologically, antiperistaltic waves can always be seen after an ileosigmoidostomy, moving the faeces towards the splenic and hepatic flexures, and even as far as the caecum. Apart from this, an exaggerated antiperistalsis should always be considered as pathological, and as an indication of serious intestinal obstruction.

Ulcerative Tuberculous Colitis.—Brown and Sampson²⁴ consider that this condition can be diagnosed by x rays with a considerable degree of certainty when the disease is far advanced. They also advance the proposition that no examination of a patient with pulmonary tuberculosis can be considered to be complete without an x -ray study of the intestines, and that this intestinal condition is very much more frequent than has hitherto been supposed to be the case. Hypermotility and spasm, or filling defects, are the x -ray signs chiefly to be relied upon.

Bones.—Howard Pirie²⁵ describes, and publishes a radiograph of, a small ossicle to be found at the upper posterior aspect of the **Navicular Bone of the Tarsus**. He found this ossicle in eight cases in which there was no history of an injury. In one case it was present in both feet. The importance of this observation is to guard against the condition being diagnosed as due to an injury. Professor Robinson, of Edinburgh, reports that, although he had never seen or heard of such an accessory bone, he had suspected that it occasionally existed, because he had found an articular surface for it on the navicular bone, the actual bone itself having been lost in the process of maceration.

George Pirie²⁶ calls attention to some abnormalities of the bones of the foot which might lead to errors in diagnosis. The case he especially records showed that the scaphoid of each foot was developed from two centres, with the result that they never coalesced, and the bone was apparently double. All these possible abnormalities become of great importance in view of the Workmen's Compensation Act, and it is necessary to be on the look-out for them; in such cases the sound foot should be compared, radiographically, with the injured one.

Allied to the same subject is the question of **Fracture of a Sesamoid Bone**. Scott²⁷ has kept a record of congenital variations of the sesamoids of the big toe, and finds that they are fairly frequent. It is to be noted that all his cases indicated that it was the inner bone which showed these variations, and it appears that the variations are usually in both the feet—an important point. The variations noted are that the bone is in two, three, or even four pieces.

The differential x -ray diagnosis of some of the rarer types of bone disease is by no means an easy matter. Two papers, one by Holmes²⁸ on the x -ray appearances in **Osteomalacia**, and a second by Perkins²⁹ on **Osteitis Deformans**, are well illustrated, and emphasize many points of importance. Both papers will be found useful in the consideration of some of the obscure cases of bone disease occasionally met with where the x -ray appearances are not quite definite, and the illustrations will be found useful for making comparisons.

Boardman³⁰ is insistent on the importance of using special positions in the *x*-ray study of **Shoulder** cases, and criticizes severely the making of a negative diagnosis on the usual antero-posterior view. The special point is that in the usual position the great tuberosity, so often fractured, is in front, and is not well shown; to get a good view of it the humerus must be externally rotated to its full extent. [An effective answer to such a criticism would be that in the examination of the shoulder-joint and neighbourhood, stereoscopic plates should always be made. If this is done, niceties of position need not be considered.—C. T. H.]

Lungs.—Bowen³¹ quotes nine cases in which a condition of **Chronic Bronchitis** had existed for a number of years, the exciting cause being a **Foreign Body in a Bronchus**. In one a tack had been present for seven years, and in another a piece of bone for nine years. Several had been treated for pulmonary tuberculosis. The history and radiography of these cases made a striking picture, and in most of them the discovery, by means of *x* rays, of the foreign body, was followed by its removal, and the subsequent cure of the patient.

The paper by Selby³² entitled "**Hæmorrhagic Pneumonitis**", based on the results of *x*-ray examination of a large number of cases during the influenza epidemic of 1918, is of great interest. It should be read with another one by Honeij³³ on influenza and bronchopneumonia. There are a large number of radiographs illustrating both these papers which demonstrate clearly the *x*-ray points. Selby insists that a definite prognosis can be made from the *x*-ray plates alone, in most of the cases, after the third daily plate has been taken. This prognosis is based upon the rapidity with which the hæmorrhage spreads to the other lobes. He bases the paper on 470 cases, in which 3400 plates were taken.

The *x*-ray appearances of **Streptococcus Emyema** afford Stewart³⁴ an opportunity of reproducing some fine radiographs well deserving of special notice. A considerable part of this paper is given up to the various methods of injecting *x*-ray opaque substances into the cavities. A satisfactory paste was made up of carbonate of bismuth 15 per cent, vaseline 73 per cent, and wax 2 per cent; but in the case of large cavities a more satisfactory and safer injection was found to be a 15 per cent neutral solution of *thorium nitrate*.

Heart.—A full description of the radiographic technique for the estimation of the amount of **Hypertrophy of the Left Ventricle** is given by Morison and White,³⁵ who have devised and describe a simple piece of apparatus which can be attached to any screen, and which facilitates the procedure. Their results in sixteen cases are annexed, and the opinion is expressed that the value of the method lies in the evidence it gives of a hypertrophied ventricle before ordinary clinical evidence reveals such a condition.

Splenic Calculi.—Mitchell³⁶ reports on a case of this condition, and shows the radiograph of the spleen after its removal from the body. A large number of dense shadows could be seen, and each was found to be caused by a stone embedded in fibrous tissue; analysis showed them to consist of nearly 68 per cent calcium carbonate. Their origin and pathology are uncertain. The author suggests that they are miliary tuberculous foci which have become healed and calcified. From the *x*-ray point of view, if few in number and in an elongated spleen, they might be mistaken for renal calculi.

Prostatic Calculi.—Hubeny,³⁷ basing his remarks upon a case in which fifty-four such calculi could be counted on the radiograph, states that, although the diagnosis of these calculi can be definitely established, it is surprising how little *x*-ray literature there is on the subject. He discusses what references there are, fifteen in number, and it is evident from a study of these that the routine *x*-ray examination for this condition is far from being a current practice. The

importance of the diagnosis lies in the fact that such stones can in many cases be expressed through the urethra, and the opening up of the bladder avoided, when their presence is definitely established.

REFERENCES.—¹*Arch. d'Élect. Méd.* 1918, 423; ²*Proc. Roy. Soc. Med. (Laryng. Sect.)* 1919, 33; ³*Amer. Jour. Rönt.* 1919, 191; ⁴*Jour. Laryngol. Rhinol. and Otol.* 1919, Feb.; ⁵*Ann. Surg.* 1919, July, 95; ⁶*Deut. med. Woch.* 1914, 1205; ⁷*Münch. med. Woch.* 1918, Nov.; ⁸*Med. Rec.* 1919, 509; ⁹*Proc. Roy. Soc. Med. (Laryng. Sect.)*, 1919, 111; ¹⁰*Amer. Jour. Rönt.* 1919, 279; ¹¹*Surg. Gyn. and Obst.* 1916, 165; ¹²*Jour. Amer. Med. Assoc.* 1913, 1960; ¹³*Amer. Jour. Rönt.* 1919, 376; ¹⁴*Ibid.* 459; ¹⁵*Bull. Johns Hop. Hosp.* 1918, No. 330; ¹⁶*N. Y. State Jour. of Med.* 1918, Nov.; ¹⁷*Brit. Med. Jour.* 1919, ii, 33; ¹⁸*Ibid.*, i, 693; ¹⁹*Arch. Radiol. and Elect.* 1918, Nov., 191; ²⁰*Ibid.* 1919, July, 37, etc.; ²¹*Lancet.* 1919, i, 91, and *Arch. Radiol. and Elect.* 1919, March, 301; ²²*Amer. Jour. Rönt.* 1919, 78; ²³*Presse Méd.* 1919, Jan.; ²⁴*Jour. Amer. Med. Assoc.* 1919, July, and *Amer. Jour. Rönt.* 1919, 469; ²⁵*Arch. Radiol. and Elect.* 1919, Aug., 93; ²⁶*Ibid.* June, 12; ²⁷*Ibid.* 1918, Dec., 224; ²⁸*Amer. Jour. Rönt.* 1918, 597; ²⁹*Ibid.* 1919, 151; ³⁰*Surg. Gyn. and Obst.* 1919, June, 615; ³¹*Amer. Jour. Rönt.* 1919, 111; ³²*Ibid.* 211; ³³*Ibid.* 226; ³⁴*Ibid.* 57; ³⁵*Arch. Radiol. and Elect.* 1919, Feb., 282; ³⁶*Ibid.* July, 59; ³⁷*Amer. Jour. Rönt.* 1919, 286.

RADIOTHERAPY.

The treatment of disease by x rays and radium has now reached a stage of development in which it is not possible to draw definitely a dividing line between the two in writing a review of the year's work. Some cases appear to be more suitable for radium—for example, rodent ulcer, especially when it attacks the parts bordering on the eye; other cases—for example, exophthalmic goitre—are better treated by x rays; but many cases of rodent ulcer will yield to x -ray treatment, and success in exophthalmic goitre can be obtained by the use of radium. There is no sharp dividing line between the rays themselves and the results they bring about. For these, as well as other reasons, therefore, radiotherapy of all kinds will be brought under the one heading.

Knox's¹ address on x -ray therapy is so complete, concise, and masterly a review that it should be read as an introduction to the subject by all practitioners of medicine. After dealing with the physics of x rays and their effects upon living cells, he describes the recognized therapy for ringworm, enlarged glands, goitre, blood diseases, the pelvic organs, and malignant disease. The indications for treatment, its methods, and the results which may be expected, all fall under review. A very fair description of what can be done with x rays, when skilfully applied, is given, and no extravagant claims are made.

Lazarus-Barlow,² writing on the biological effects of small quantities of Radium, describes a number of experiments, of which two especially show that under certain conditions the exposure of the animal cell to radiation is in the direction of stimulation, both for alpha and gamma rays. This has a distinct bearing on the question of cancer, and the author considers that there is some close association between the rays and cancer, as evidenced by the occurrence of x -ray cancer, the fact that small quantities of radium have been found in cancerous, whilst it is absent in non-cancerous, tissue, and the fact that gall-stones do not contain radium unless associated with primary carcinoma of the gall-bladder. Experiments bearing on the attempt to produce malignant disease are described, and in conclusion it is suggested that, when we have learned how to control the radiations and the responses made by the various kinds of cells to stimulation with different varieties of wave length and different combinations of varying wave lengths, we shall be able to control the processes of health and disease in a manner undreamed of at the present time. Investigations by S. Russ³ and others as to the results obtained by small doses of x rays have been conducted on the following lines: (1) The effects of small doses upon the blood; (2) The production of lymphocytosis by small doses; (3) The part played by the lymphocytes in resisting the growth of rat sarcoma; (4) The production of the immune condition by repeated small doses. What is meant

by a small dose is described. The investigation has led to the conclusion that x rays administered to an animal have two actions, quite apart from their direct action upon a tumour: (1) A large dose of x rays, by destroying the immune condition, will favour the growth of a tumour; (2) Small doses, by producing the immune condition, will help to control and may overcome the growth of a tumour. This leads the authors to a very important but somewhat disconcerting conclusion, namely, that whenever a tumour is exposed to x rays, the lymphocytes in the blood-vessels of the growth and surrounding area will be irradiated, and the same applies to lymphocytes in post-operative treatment. It follows that, whilst the primary growth is getting the dose required to destroy it, secondary growths may be encouraged in consequence of lowering the powers of resistance of the patient; this is especially likely to happen when large post-operative doses are repeated at fortnightly intervals. However, it is further stated that by the use of small doses of x rays repeated at intervals, it may be that the resistance against the development of secondary deposits can be increased. Both these papers are suggestive in ideas, and valuable as indicating the lines on which treatment should be directed.

A paper by Hall and Whipple⁴ on "X-ray Intoxication: Disturbances in Metabolism produced by Deep Massive Doses of the Hard X Ray" deserves careful study. After reviewing and discussing the literature (60 references are given), the authors describe their experiments on dogs, and the complete examinations made before and after death or during recovery following on a large dose of x rays. The findings are discussed in connection with the recorded observations which many writers have made upon symptoms, etc., which have been noticed in human beings. The paper is a long one, raises many interesting problems, and brings out some equally interesting facts. Amongst the salient features are the following: After a **Lethal Dose of X Rays** a dog remains apparently quite well for from one to two days; vomiting and diarrhoea then dominate the picture until death on or about the fourth day. The elimination of urinary nitrogen increases from the first. The blood non-protein nitrogen shows a marked increase on the day before and on the day of death. There is distinct evidence of epithelial injury of the intestinal mucosa. There is no evidence of any x -ray anaphylaxis or of nephritis. No satisfactory explanation can be found for the latent period preceding the appearance of an x -ray burn. A point which at the present time is of the greatest importance to radiologists is emphasized: the danger of constitutional reaction and subsequent intoxication is in direct ratio to the hardness of a tube; that is, the 'hard rays' of a **Coolidge Tube** with a wide spark-gap have much greater capacity to cause tissue injury—which is responsible for the constitutional reaction—than the rays of the older types of tube.

Perry⁵ has made some interesting experiments on the effects of x rays on certain *bacteria*. Generally speaking, the literature of the subject tends, notwithstanding the contrary observations of one or two workers, to prove that x rays do not kill bacteria in either inert media or in living tissues. These experiments, fully described, support this view, and the conclusions are: (1) X rays in human dosage have no effect on *B. typhosus* and *S. aureus*; (2) X rays in human dosage do not prevent the development of experimental glandular tuberculosis, nor do they destroy the organisms in fully-developed glandular tuberculosis; (3) X rays seem definitely to increase the susceptibility of *B. typhosus* and *S. aureus* to killing by heat.

The paper by Sampson Handley⁶ "On the Mode of Spread of Cancer in relation to its Treatment by Radiation" is of importance and should be read. The author pays a striking tribute to the value of x -ray treatment—prophylactic, following operation—and has had all his cases so treated for the past fourteen

years. He is satisfied that this practically prevents recurrence in the skin adjoining the operation scar. The main point of the paper is to show that the real spreading edge of a cancer may be a considerable distance from the primary focus; that it is subcutaneous and invisible; that disappearance of cancer cells may take place in the rear of the advance. It follows, therefore, that in the treatment of a breast after its removal for cancer, a very wide area should be irradiated; this area may be the circumference of a circle with a 14-in. radius from the original centre of the growth. Further, that it is of paramount importance that the extending edge should receive the most active treatment, as only by its arrest will success be achieved. The appearance of *isolated nodules in the skin* round the scar is an indication that total destruction behind the advancing edge has not taken place, and these isolated nodules must not be looked upon as the main enemy. They often disappear under treatment, but if they, and they alone, are attacked, and the far-off edge is neglected, then no real cure—or arrest—can be looked for.

Elliott⁷ holds that **Epithelioma of the Lower Lip** (smoker's cancer) is a form of cancer which, perhaps, best lends itself to treatment by radium; that this is the treatment *par excellence*; the cosmetic results are most excellent, there is no pain, and the result of treatment is permanent. If an early diagnosis is made, radium is preferable to operation.

Metcalf⁸ gives some personal experiences of burning caused by *secondary x rays*, and these have a distinct bearing on the protection of a patient during treatment. The author developed what appeared to be a typical x-ray ulcer on the back of his wrist which corresponded to the position of a silver bracelet-watch which he wore. In addition, on the left and right legs, corresponding to metallic portions of sock suspenders, two ulcers developed. It took from two to three months for the ulcers to heal. It is of interest to note that the watch had an intervening thick leather strap between the metal and the skin. Attention is drawn to the fact that these ulcers came after an x-ray career of fifteen years, and that the conditions under which he was working at the time of their occurrence were no different from those of the latter years of this work. He is at a loss to account for the reason, but warns workers that leather, rubber, and clothing are no certain protection under similar circumstances, namely, metal in close proximity to the skin.

REFERENCES.—¹*Lancet*, 1919, ii, 183; ²*Arch. Radiol. and Elect.* 1919, June, 1; ³*Lancet*, 1919, i, 692; ⁴*Amer. Jour. Med. Sci.* 1919, April, 453; ⁵*Amer. Jour. Rönt.* 1919, 467; ⁶*Proc. Roy. Soc. Med. (Elect.-Ther. Sect.)*, 1919, June, 41; ⁷*Internat. Jour. of Surg.* 1918, Dec. (quoted in *Lancet*, 1919, i, 388); ⁸*Proc. Roy. Soc. Med. (Elect.-Ther. Sect.)*, 1919, June, 13.

ELECTROTHERAPEUTICS.

Ununited Fractures.—Barclay¹ has endeavoured to promote the union of ununited fractures by electrical stimulation applied on novel lines. He was induced to take up this work owing to the large number of cases following war injuries, but did not restrict his experimental work to these cases only. The technique described is simple. One electrode is placed in position when the splint is applied, in such a way that it can be moistened when the treatment is given, and there is no necessity to remove the splint each time. The current of choice is a sinusoidal one; failing this a weak current from a Bristow coil. The strength should be just sufficient to excite the muscle fibres—the idea being to cause fibrillary movements without any gross movement of the muscle itself. The current should be turned on slowly, and there must be no pain, merely a pleasant tremor. Over-fatigue must be especially guarded against. The splints usually in use were found unsuitable, and the author devised others which are described. Radiographs showing the formation of callus under this

stimulation illustrate the article. One of the best results was in a case of non-union after an osteotomy of the tibia. This had been bone-grafted four times and plated once. There was complete non-union. Three months after the new treatment was commenced, clinically and by *x* rays there was evidence of union, and in seven months this was complete. This suggestion appears to be one that should be given a more extended trial.

Ionization.—Ind,² discussing methods for the cure of **Multiple Small Warts**, failed altogether with magnesium sulphate ionization. Wainwright,³ in a letter commenting upon this, suggests that the cause of failure was the omission of an important detail. Before the ionization each wart should be superficially pricked with a fine needle. This can be done rapidly and painlessly without causing any discomfort. Then with a current of 20 to 25 ma. the treatment is uniformly successful. The warts show no change for from seven to nine days, and then vanish.

Diathermy.—Iredell⁴ and others report on the result of their investigation on the usefulness of diathermy in the treatment of **Carcinoma of the Uterine Cervix**. The operative technique is described, and a special point is made that all soft breaking-down growth should be scraped away before the application. The reason for this is that less current can then be used, and consequently the constitutional disturbance is less. The relief as regards pain, bleeding, and discharge in inoperable cases is worth the treatment from the point of view of the relief of the sufferings of the patient. A technical paper on the diathermy apparatus itself by Dowse and Iredell⁵ gives much valuable information as regards the best methods to connect up patients so as to ensure safety. Fulguration and diathermy are contrasted by Iredell and Turner,⁶ and the essential differences made clear. Their application to some twenty cases of various kinds is given and the results are indicated. The methods are of value in the treatment of extensive **Localized Malignant Growths**, in which surgical treatment alone is not likely to be successful; and whilst diathermy is probably more efficacious than fulguration, the latter is less likely to damage large vessels and other important structures. In **Diseases of the Eye**, Iredell and Ryley⁷ use a special electrode formed like an eye cup and having a metal connexion at its bottom with which it can be connected to the diathermy machine. The cup is filled with normal saline solution and applied to the eye in the ordinary way. The current has a marked palliative effect both as regards relief of pain, and the reduction of inflammatory symptoms in chronic inflammatory conditions. Iredell⁸ has used the diathermy current in thirty-four cases with the idea of **Stimulating Intestinal Movements**, and claims that he obtained definite action on the movements of the intestinal canal, both in producing peristalsis and in checking diarrhoea and vomiting, and this in cases when ordinary medicinal means had failed. He also records his failure to produce any favourable results in a number of different diseases. Barber⁹ reports a case of **Acne** of very long standing which appeared to be due to some form of intestinal intoxication. A healthy appendix was removed first, then the diathermy current was applied to tone up the cæcum and colon. The whole appearance of the patient changed for the better, and the acne almost disappeared.

¹ REFERENCES.—¹*Arch. Radiol. and Elect.* 1918, Dec., 205; ²*Brit. Med. Jour.* 1919, ii, 11; ³*Ibid.* 204; ⁴*Proc. Roy. Soc. Med. (Elect.-Ther. Sect.)*, 1919, June, 16; ⁵*Ibid.* 18; ⁶*Ibid.* 23; ⁷*Ibid.* 31; ⁸*Ibid.* 34; ⁹*Ibid.* 37.

Part II.—The Dictionary of Treatment.

A REVIEW OF MEDICAL AND SURGICAL PROGRESS FOR 1919, BY MANY CONTRIBUTORS.

ABDOMEN, DISORDERS OF. *E. Wyllys Andrews, A.M., M.D., F.A.C.S.*

Pre-operative Purgation.—Emge¹ calls attention to a few facts about pre-operative purgation which deserve attention. Purgation causes a hyperæmia of the entire intestinal mucosa. A great deal more gas is formed in the intestines than is ever passed per rectum, a large proportion being absorbed into the blood-stream. Vascular congestion seriously interferes with this absorption (Schmidt²), and may even cause the blood to give up gases to the bowel (Woodyatt and Graham³). Many observers have noted that there is less gas in the bowel in operations where the patient was not 'prepared' by purgation. It has also been remarked that these patients had less pain after operation. In spite of these well-recognized facts, it is the usual custom in a great many clinics to give violent purges as a routine before every operation. [We are in full accord with these observations, and are strongly of the opinion that a simple enema the night before is ample preparation for most surgical procedures.—E. W. A.]

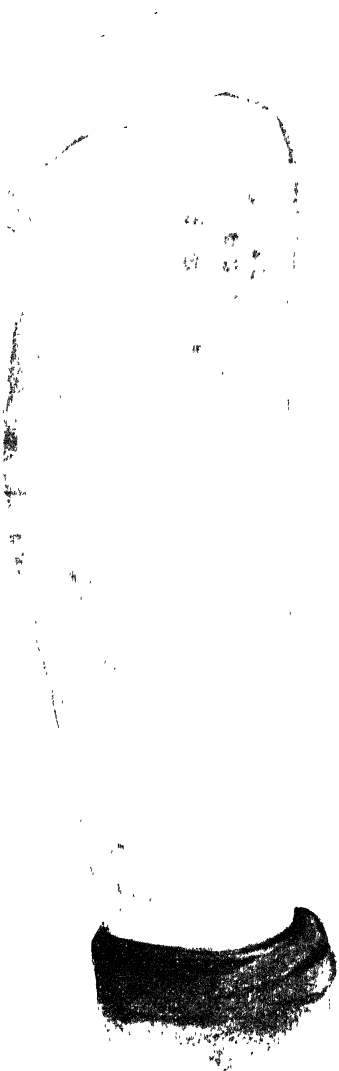
Acute Perforations of Abdominal Viscera.—W. J. Mayo⁴ gives the following summary of his paper on this subject: (1) It may be said that a considerable percentage of free perforations are spontaneously closed, and that the area of peritonitis is limited through natural processes; the death-rate is possibly 30 per cent, but the 70 per cent of patients who may recover spontaneously from the attack are not cured. (2) An exploration through a longitudinal incision just to the right of the mid-line gives the surgeon an opportunity to make a careful exploration and to deal with any or all varieties of perforation. (3) Early operation—that is, within the first eight hours—barring accident, means recovery, because the stage of contamination has not yet passed on to infective peritonitis, and measures may still be taken for the permanent cure of the condition which leads to the perforation. (4) Chronic conditions usually precede perforation and give ample warning of their presence before it takes place. While this is accepted so far as the appendix is concerned, it has not been so generally recognized that gall-stones are foreign bodies which need only infection to lead to the most widespread peritonitis, cholangitis, biliary cirrhosis, and pancreatitis. (5) Chronic ulcers of the stomach and duodenum, after a reasonable attempt has been made at medical cure, should be looked on as surgical maladies.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, Sept. 14, 878; ²*Klin. der Darmkrankheit*, 1913, 440; ³*Trans. Path. Soc. Chicago*, 1912, viii, 354; ⁴*Surg. Gyn. and Obst.* 1919, Jan., 28.

ACNE ROSACEA. Copper Sulphate recommended for (p. 6).

PLATE IV.

ACNE SCROFULOSORUM



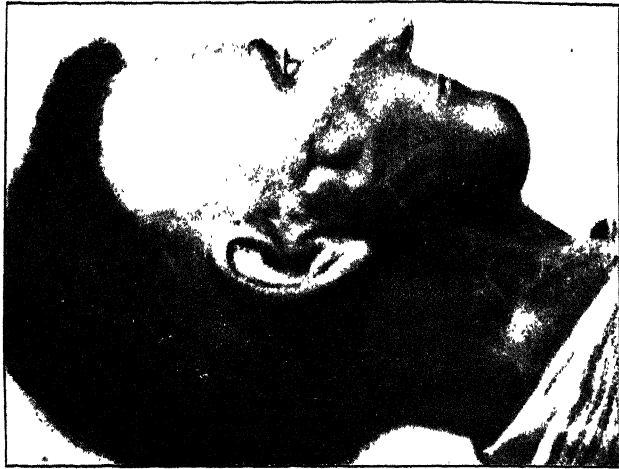
E. Graham Little

PLATE V.

ACTINOMYCOSIS



MEDICAL ANNUAL, 1930



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ACNE SCROFULOSORUM AND LICHEN SCROFULOSORUM.*E. Graham Little, M.D., F.R.C.P.*

Wise¹ considers that the time has come to discard the theory of these types of disease being due to toxins generated by the tubercle bacillus, a theory which gave us the class of 'toxi-tuberculides', as defined by Darier. Wise regards these, on the contrary, as definitely tubercloses, and this diagnosis is no longer dependent on the finding of bacilli in the tissues. "The variations in the form and type of eruptions provoked by the tubercle bacillus seem to depend therefore on three chief factors: (1) The individual disposition of the patient; (2) The number of bacilli circulating in the blood-stream; and (3) The degree of immunity reaction residing in the affected organism". *Plate IV* is taken from a case of Graham Little's of the papulo-neerotic tuberculide, named 'acne scrofulosorum' by Crocker and Colcott Fox.

REFERENCE.—¹*Jour. Cutan. Dis.* 1919, xxxvii, 105.

ACROMEGALY OF THE LARYNX. (See LARYNX, ACROMEGALY OF.)**ACTINOMYCOSIS.***Herbert French, M.D., F.R.C.P.*

Notwithstanding the enthusiasm with which the value of Vaccine in the treatment of actinomycosis has been recorded from time to time, the absence of apparent benefit from this line of treatment in certain distressing cases that were met with in soldiers during the war convinced one that, whether vaccine is employed or not, other lines of treatment which may help the patient must be welcomed and tried. Iodide of Potassium is, as a rule, the mainstay as regards drugs; but this, though benefiting some patients enormously, seems to touch others hardly at all. The value of local applications of the X Rays as an additional line of treatment is recorded by Jüngling,¹ who used it for actinomycosis of the head and neck, two stages of the resultant cure being illustrated in *Plate V*. In his original paper, which should be consulted, he gives details of the method of applying the rays in such a way as to get them to penetrate to a depth of 3 cm. below the surface, using either aluminium or zinc for protecting the superficial skin; and he found that, using Wahl's method, a complete cure of a most obstinate case of actinomycosis of the neck and face resulted from three to five sittings given at intervals of four weeks.

The value of the x-ray treatment in curing Baghdad boils has been brought out even more strikingly during the war. Chronic Baghdad boils of the hands which have resisted other forms of treatment for months may often be caused to heal completely within a month after a single application of the x rays to the ulcerated surface.

REFERENCES.—¹*Munch. med. Woch.* 1919, June 27, 721.

ADENOIDS.*P. Watson-Williams, M.D.**A. J. Wright, M.B., F.R.C.S.*

TREATMENT.—Alternatives to operation for enlarged tonsils and adenoids are discussed by Donelan,¹ who, in reviewing the reported successes with breathing exercises, nose drill, or snuffs, points out the absence of evidence of a reliable diagnosis of adenoids in some of the reports of success in the non-operative treatment of these cases, favourable reports being based on such slender evidence as letters from parents testifying to an improvement in general health. He concludes on theoretical grounds that it is improbable such treatment could be successful where real hypertrophy exists, and maintains that no reliable evidence that it can take place has been adduced. Leonard Williams' articles² led him to try the use of Thyroid Extract on 20 cases in children one and a quarter to four and a quarter years old, in all of whom

the presence of adenoids had been ascertained by digital examination. The dose varied from $\frac{3}{4}$ gr. to 2 gr. daily, administered over a period of three months. Of the 20 cases, in 4 boys under two years of age a distinct result was obtained in that an operation was avoided, the remaining cases being unsuccessful. The four cases had the 'soft gelatinous' form of hypertrophy. The result of non-operative treatment must be limited by the amount of connective-tissue proliferation that has taken place, and as this proliferation is less likely in the very young, it is in their case that success is most likely.

REFERENCE.—¹*Jour. Laryngol.* 1919, July, 229; ²*Lancet*, 1909, May 1,

ALCOHOLISM AND DRUG ADDICTION. *Bedford Pierce, M.D., F.R.C.P.* *Marguerite Wilson, M.B., Ch.B.*

There is a considerable output of literature dealing with the treatment of alcoholism in American medical periodicals, but little is recorded that is new. It would seem that the question is more serious in America than in this country. In New York, Laase¹ refers to the 10,000 criminal addicts in that city, and states that they form only a small percentage of the total number of addicts, which may be estimated at 100,000 to 250,000.

The accounts given of the etiology of alcoholic addiction are extremely various. Pierce Clark² dwells upon psychological factors, and especially refers to homo-sexual tendencies which lead men to leave their homes to drink with men; he then proceeds to the influence of sadistic and masochistic complexes and other factors that no one but a confirmed psycho-analyst would consider seriously. He states, however, that the chronic alcoholic is by far a less favourable subject for pure analytical treatment than almost any neurotic. Scheffel,³ in placing insomnia at the head of the list of etiological factors, does not assist much in elucidating the problem, and he makes the disquieting statement that physicians produce more addicts than the profession would like to admit, and are responsible for creating a large proportion of cases.

Rosewater⁴ maintains that drug addiction causes acidosis, and that it responds to Alkaline Therapy. Chemical analysis of the blood in five cases showed a marked reduction of the alkaline reserve, the lowest case having 29.6 per cent and the highest 48.5 per cent of CO_2 . He consequently recommends giving Sodium Bicarbonate, intravenously in salt solutions, and by the mouth in copious watery solutions. He employs the Pettey purge and supplies carbohydrate by glucose solution. He claims that the drug can be withdrawn with remarkable facility by these methods without subjecting the patient to severe deprivation symptoms.

Du Metz⁵ gives a valuable review of recent experimental researches, quoting from no less than 48 authors. His conclusions are, briefly, that the factor which enable the system to acquire toleration of sedative drugs is still unknown; that these drugs are excreted in the faeces in decreasing amounts during the period of acquiring toleration, but whether this disappearance is due to destruction within the body is still an unsettled question. It has been shown by Valenti⁶ that in drug-takers who have been accustomed to large doses, the blood serum contains a substance which, injected into normal dogs, produces symptoms similar to those produced by rapid withdrawal of the accustomed dose; and also that these symptoms are at once relieved if the narcotic drug in question is administered.

McIver⁷ questions the value of all the 'so-called specific methods' of treating the drug habit. He advises hospital treatment, a very thorough physical examination, and the taking of a complete history of the case. Every effort should be made to discover the factor which started the habit. He urges gradual withdrawal of the drug. For the first twenty-four hours the

patient should be given enough to keep him comfortable—the physician thus acquaints himself with just how much the patient really needs. The same drug must always be given. Insomnia is best treated by **Hot Baths**; but if persistent, **Bromides**, **Trional**, or **Scopolamine** may be given. Restriction of diet and washing out of the stomach usually ameliorate the nausea and vomiting. For the so-called ‘withdrawal pains’, electric massage is beneficial. **Free Purgation** is essential. Stimulants may be necessary in the aged and debilitated. The after-treatment is bed, tonics, and a liberal diet, with, later, moderate and graduated exercises. Change of environment afterwards, when possible, is highly desirable.

Baldi⁸ believes in a rapid and absolute withdrawal of the drug. He tabulates his method of treatment: (1) Isolation; (2) Absolute control of the patient; (3) Deprivation of the drug; (4) No substitution of any narcotics; (5) Elimination by bowels, kidneys, and skin; (6) Rest, nourishment, and work.

REFERENCES.—¹*Med. Rec.* 1918, Aug. 9, 228; ²*N.Y. Med. Jour.* 1919, May, 930; ³*Med. Rec.* 1918, Nov., 853; ⁴*Ibid.* 1919, Aug. 9; ⁵*Jour. Amer. Med. Assoc.* 1919, April 12, 1069; ⁶*Arch. f. exper. Path. u. Pharmac.* 1914, lxxv, 437 (abstr. in *Jour. Amer. Med. Assoc.* 1919, April 12, 1072); ⁷*Arch. Neurol. and Psychiat.* ii, No. 4; ⁸*Ibid.*

ALOPECIA, INFLUENZAL.

E. Graham Little, M.D., F.R.C.P.

Simpson¹ advocates careful attention to the hair during and immediately after influenzal attacks as a means of combating the serious effect in promoting alopecia which is ascribed to this disease. The author relies chiefly on two means of treatment—exposure to the **Kromayer Lamp**, three or four applications usually sufficing to control the fall of hair, and rubbing of the scalp with a weakly alcoholic solution of **Collosol Sulphur**. Once the fall is arrested, the patient may continue with a 3 per cent alcoholic lotion of **Salicylic Acid** and **Resorcin**.

REFERENCE.—¹*Med. Rec.* 1919, March 8, 402.

AMŒBIASIS.

Sir Leonard Rogers, M.D., F.R.S.

ETIOLOGY.—H. M. Woodcock¹ deals with the epidemiology of amœbic dysentery in Egypt, and points out that the disease is much more prevalent near the damp Mediterranean coast than in the much drier Suez area, which he holds is related to the rapid destruction of cysts by drying. The seasonal distribution of the disease is also in accordance with this fact at Port Said, where the percentage of amœbic infections fell in April with dry winds, and reached its highest point in August, when the humidity was also at its maximum, after which both curves again fell simultaneously. He found little indication that flies spread amœbic dysentery, although they are an important factor in the incidence of the bacillary disease. Cutler and Williamson² advise emulsifying a loopful of a stool with a 1–10,000 solution of neutral red in normal saline to facilitate the differentiation of *E. histolytica* and *E. coli*, and examining with a $\frac{1}{8}$ -in. objective under a coverglass. *E. histolytica* thus treated shows uniform pink staining of the endoplasm, while *E. coli* is unstained. M. Bloch and C. Mattei³ have studied nearly 500 cases of amœbiasis in France; nine-tenths of them had not been out of the country, while in 40 per cent only diarrhoea was present. Liver abscess was rare. R. Ciauri⁴ writes on the blood changes in cases of amœbiasis from Macedonia and Libya, and found an increase of the mononuclears and eosinophils to be very constant.

C. A. Kofoid, S. I. Kornhauser, and O. Swezy⁵ describe and illustrate the differentiation of the entamœba of amœbic disease from other organisms met with in the human intestine. Full descriptions are given of the *E. dysenteriae*, *E. nana*, and *E. coli*, and their cysts. For staining purposes they use the following solution: saturated solution of eosin in normal saline, two parts; 5 per

cent potassium iodide in normal saline saturated with iodine, one part; normal salt solution, two parts. A minute piece of faeces is rubbed up in a small drop of normal saline, and a second piece in an adjacent drop of the iodine-eosin stain, and the two drops are covered with a single coverglass. Living organisms appear in the unstained part, while the cysts first stand out clearly in the pink-stained drop, and after a time they stain yellow with iodine, and the nuclei become more clearly defined.

PREVALENCE.—J. C. Watt⁶ deals with dysentery in East Africa, and shows by very early microscopical examination of the stools, within a few hours of the onset, that amœbic dysentery was much more prevalent there than is generally supposed, namely 75 per cent, although in the late chronic stages seen at the base hospitals the amœbæ may be much more difficult to find. He agrees that the presence of red corpuscles is evidence of *E. histolytica*, but considers a yellowish tinge and the explosive type of movement are also diagnostic of the pathogenic amœba. He thinks there is often a secondary bacillary infection, when the cellular exudate makes the amœbæ more difficult to detect. The wonderful effect of Emetine injections in 1-gr. doses for fifteen days under most unfavourable field conditions completed the proof that the prevailing type of dysentery in East Africa was amœbic. W. Fischer⁷ deals with the blood changes in amœbic dysentery, and found only a moderate degree of leucocytosis, with no constant change in the relative count. W. Yorke⁸ deals with amœbic dysentery in England; he found 11·5 per cent of 4000 chronic or convalescent dysenterics to show *E. histolytica* cysts, 450 non-dysenteric soldiers showed them in 7·8 per cent, while young recruits showed 5·6 per cent, demonstrating no very great difference. He does not think there is much reason to fear the spread of the disease in England, some factor being apparently absent. He found that a combination of emetine with Deek's treatment, with massive doses of bismuth subnitrate, gave the best result, and invariably cleared the stool of amœbæ. Sir William Osler⁹ agrees that there is little danger of the occurrence of dysentery epidemics in England, and he attributes the greatly diminished occurrence of severe complications, especially liver abscess—as compared with his earlier experience in Baltimore—to the use of emetine.

TREATMENT.—W. MacAdam⁹ reports favourably on the use of 1 gr. of Emetine Hydrochloride hypodermically, and $\frac{1}{2}$ gr. by the mouth at bedtime daily for twelve days; 80 cases were so treated, and an average of 26 protozoological examinations made per case during six to eight weeks in hospital, while the after-history up to at least six months was obtained in 71 of them. Relapses amounted to 1 out of 12 acute cases, 11 out of 36 chronic relapsing ones, and 6 out of 32 *E. histolytica* cyst carriers. The symptoms disappeared in an average of 4 days in the acute cases, and the entamœba in 1·5 days, while the persistence of infection in cyst carriers averaged only 2·5 days. Of 18 relapses, 13 occurred within four weeks. Of the 62 cases declared 'cured' after repeated examinations of the stools, only one relapse was subsequently reported. The results were thus considerably better than with emetine injections alone, while they compare favourably with the results obtained with the much more drastic and irritating courses of emetine bismuth iodide. The difficult chronic cases should be prevented by efficient treatment in the early acute stage. S. K. Simon¹⁰ discusses the comparative value of *Ipecacuanha* and its alkaloids in amœbiasis. He lays stress on the toxic effects of frequently repeated injections of emetine salts, and he prefers the crude ipecacuanha root, on account of full doses by the mouth never being toxic, while it destroys the encysted forms as well as the vegetative entamœba. [See note by the writer in the MEDICAL ANNUAL, 1918, p. 85, which advocates following a few daily injections of 1 gr.

of emetine by full doses of ipecacuanha by the mouth, which has continued to afford him good results without any toxic signs.—L. R.] Ciauri⁴ has treated 990 cases, with only 90 remaining carriers, with 1- to 2-gram. doses of emetine hydrochloride once or twice a day hypodermically, Bismuth internally, and rectal injections of Tannin, Quinine, and Thymic Acid. After diarrhoea has ceased, an eight-day interval is allowed, the course is repeated, and again a third time after fifteen days' further interval.

M. E. Barves and E. C. Cort¹¹ in Siam have used with success Oil of Chenopodium in amœbic dysentery, a number of cases being clinically cured by it, although some failed to respond, its value having been enhanced by the difficulty in obtaining emetine in Oriental countries during the war. Either 1 c.c. was given in a capsule two hours after $\frac{1}{2}$ oz. of sodium magnesium sulphate, and repeated after one hour, followed by 1 oz. of castor oil; or in severe cases 2 c.c. of oil of chenopodium was given in the dose of castor oil without a preliminary purge. Full doses must not be repeated in less than two or three weeks, on account of its irritating action on the kidneys. The oil has also been given in emulsion in gum acacia by the rectum, the mucous membrane being protected by the injection of 2 oz. of petrolatum.

J. Leidy¹² reports a single case of amœbic dysentery treated with apparent success by 30 gr. of powdered grated Nutmeg three times a day, the use of this remedy having been recorded by Woodward in the American Civil War.

Amœbic Hepatitis and Liver Abscess.—R. J. McN. Love¹³ reports 20 cases of liver abscess in Mesopotamia treated by the open operation, with a minimum of 65 per cent mortality, largely due to the number of acute cases with multiple abscesses. Paiseau and Hutinel¹⁴ write on chronic amœbic hepatitis with repeated attacks at intervals of from six months to several years, and eminently amenable to Emetine, although in older cases prolonged treatment is necessary. G. Cotte and Chifoliau¹⁵ record their experience of liver abscess in Macedonia. Frequently after a negative puncture of the liver the symptoms disappeared under emetine, but if pus was found they proceeded to do the open operation, and lost 8 out of 15 cases, although 8 were the more simple anterior ones, some only having been recognized late in the disease. P. Ravaut and Charpin¹⁶ record a careful study of 21 cases of amœbic hepatitis, with abscess formation in 12, and note with surprise a number of points concerning the affection which are well known to workers in the tropics. Out of 8 cases in which the abscess was opened, 5 recovered; while of 4 submitted to aspiration only, with the administration of emetine, all recovered, as did 9 non-suppurative cases given the same drug, the great value of which they confirm. Cros and de Teyssier¹⁷ report similar results, including a case of liver abscess cured by aspiration and injection of emetine into the cavity without drainage. K. K. Chatterji¹⁸ records further successes in the treatment of liver abscess by aspiration and emetine without drainage; he now adds washing out the abscess cavity through the cannula with a measured quantity of saline or iodine solution to break up the remaining debris, repeating the process until pure liquid escapes. Out of 13 consecutive cases so treated, in only 2 large abscesses had the aspiration to be repeated. This method of Aspiration combined with the administration of full doses of Ipecacuanha or Emetine (so long advocated by the writer) is thus meeting with increased favour even among surgeons.

P. Talbot¹⁹ records 15 cases of tropical or amœbic abscess of the liver seen in Baghdad. Four were treated by the open operation, with 1 death; 11 by aspiration and subcutaneous injections of Emetine, and all recovered. He is strongly in favour of the latter method of treatment, which can be carried out with an ordinary 20-c.c. glass syringe, this being detached from the needle and emptied as often as it is filled. He injected quinine into the cavity in

several cases, but found no advantage from it. It was not necessary to empty the cavity completely to get good results.

Amœbic Abscess of the Brain.—A case following on liver abscess is reported by F. L. Armitage,²⁰ with a résumé of previously recorded cases, no less than 43 out of 45 having followed liver abscess. No recovery has yet been reported.

REFERENCES.—¹*Brit. Med. Jour.* 1918, ii, 710; ²*Jour. Amer. Med. Assoc.* 1918, ii, 1348; ³*Ann. de Méd.*, Paris, 1918, v, 374; ⁴*Gior. di Med. Mil.* 1917, lxv, 934; ⁵*Arch. Internal Med.* 1919, July, 35; ⁶*Jour. Trop. Dis. and Hyg.* 1919, March 15, 45; ⁷*China Med. Jour.* 1919, March, 108; ⁸*Lancet*, 1919, i, 673; ⁹*Ind. Jour. Med. Research*, 1919, Jan., 363; ¹⁰*Jour. Amer. Med. Assoc.* 1918, ii, 2042; ¹¹*Ibid.* 350; ¹²*Med. Rec.* 1919, March 1, 354; ¹³*Brit. Med. Jour.* 1918, i, 696; ¹⁴*Bull. Soc. Méd. des Hôp. de Paris*, 1918, Nov. 8, 1007; ¹⁵*Lyon Chir.* 1918, May–June, 273; ¹⁶*Presse Méd.* 1919, Feb. 10, 65; ¹⁷*Arch. Méd. et Pharm. Mil.*, Paris, 1917, Oct., 531; ¹⁸*Ind. Med. Gaz.* 1919, 175; ¹⁹*Brit. Med. Jour.* 1919, ii, 375; ²⁰*Jour. Trop. Med. and Hyg.* 1919, April 15, 69.

AMYLOID TUMOURS OF LARYNX. (See LARYNX.)

ANÆSTHESIA.

J. Blomfield, O.B.E., M.D.

Chloroform.—Although this is more and more displaced from its once predominating position as a routine anæsthetic, there will be for a long time occasions on which it is the most convenient, and others on which it is the most suitable agent to employ. Consequently, we have not by any means reached the day when further knowledge of its action is without interest, even if such knowledge had no bearing on the action of other more widely used anæsthetics. One of the most formidable obstacles to the use of chloroform is its liability to be followed by the train of symptoms known as ‘delayed chloroform poisoning’. The causation of this prolonged and often fatal vomiting is so obscure that some have even doubted its relationship to inhalation of chloroform. Evidence, however, strongly condemns the drug and incriminates in some way the liver of the affected patient. We now have an important contribution to our knowledge,¹ which also strengthens our hands in preventing the occurrence of this serious post-anæsthetic vomiting.

The writers show that liver injury in a dog will be uniform in extent provided that the intake of food is accurately controlled. The evidence shows that a unit injury from chloroform anæsthesia under fasting conditions is repeated accurately again and again if the dog is given time to repair each injury to normal. It is contended that the recorded variations in susceptibility of dogs to chloroform is due to lack of precision in the diet conditions. Unusual individual resistance or hypersusceptibility is met with, but is rare. Delayed chloroform injury has been reported occasionally since 1850. Strassman² showed that hæmorrhage made dogs more susceptible to injury. In 1908, Wells expressed the belief that previous liver injury favours severe chloroform reaction; he also mentioned that sugar feeding protects against phosphorus poisoning, and would presumably protect against chloroform, since the liver can readily use sugar but less easily fat and protein. Puppies have been found³ to be very insusceptible to chloroform injury, and a correlation has been suggested between this and the presence in these young animals of persisting cell nests of blood-forming elements. Animals with nucleated red corpuscles—the frog, pigeon, and terrapin—are resistant to chloroform. The resistance of puppies may be due to the high glycogen content of their livers. More recently Opie and Alford⁴ have shown susceptibility to be less after a rich carbohydrate diet. The toxicity of chloroform was greatest after a fat diet. The conclusion was drawn that the great solubility of fat in chloroform, and the relative fixation of chloroform by the body fat and watery fluids, determine the increased susceptibility of animals that have received fat and stored it in the parenchyma-cells of liver and kidney. Chloroform injury depends not only on the

amount of chloroform administered, but on the subject's previous nutrition as well. The milder injuries cause fatty change in the liver, the more intense produce actual necrosis. This affects the centres of the lobules, appearing six to ten hours after the administration. Analyses of livers from fatal poisoning in human beings show a high amino-acid and fat content. Fats appear to be not only non-protective against chloroform, but actually harmful, for large amounts of protective carbohydrate fail to prevent the bad effect of fat in a mixed diet. Numerous experiments were conducted to discover whether any drugs could have the effect of sparing or of diminishing the liver glycogen, and whether such reactions would affect subsequent chloroform liver injury. Also evidence was sought as to the relationship between oxidation and liver necrosis. The most important conclusions arrived at have obvious practical application. They were :—

1. Starved animals are very susceptible to liver injury from chloroform.
2. Sugar and diets rich in carbohydrates given in the days preceding chloroform anæsthesia exert marked protective action against liver injury.
3. Fat alone, or fat in large proportion in food, induces a susceptibility comparable with that of starvation.
4. Liver and kidney exert a considerable amount of protection, and beef extract is highly protective in proportion to its actual food value.
5. Skim-milk and commercial casein are highly protective.
6. Glucose given intravenously during anæsthesia does not modify the effect on a starved animal. (*See p. 7.*)
7. Human patients should be given liberal amounts of carbohydrates and milk for two days preceding anæsthesia. It is dangerous to give chloroform to man or animal when a fasting period precedes the administration.
8. Sodium carbonate has no protective action when given intravenously during anæsthesia.
9. Epinephrin subcutaneously or intramuscularly in the days preceding the administration exerts a protective action. Quinine sulphate also has marked protective action.
10. The hypothesis that glycogen protects the liver-cell will not explain all the observed facts. The hypothesis that chloroform injury and liver necrosis depend on lowered level of tissue oxidation receives no support from the experiments.

The late L. T. Rutherford⁵ drew attention, for the first time, to the behaviour of the *lachrymal gland in anæsthesia*. His observations led to some useful practical conclusions, which are, however, marred when any preliminary hypodermic injections of morphine, atropine, or allied bodies have been employed. Rutherford pointed out that in the first stage of necrosis with chloroform (up to loss of consciousness) the activity of the lachrymal gland varies according to the strength of the irritation in the nose and air-passages, and if no vapour impinges on the cornea the canthi may remain dry. With the onset of the excitement stage, pools of secretion appear at the canthi and overflow on to the face. During the next stage—surgical anæsthesia—the glands cease to secrete, and if the canthi were dried after the excitement stage they remain dry. The cessation of the secretion usually takes place a few breaths before the complete abolition of the corneal reflex. The glands never secrete after the abolition of the normal corneal reflex. The moment at which lachrymal secretion is again observed after its cessation under the influence of chloroform or ether provides a reliable indication of the exact moment at which to continue administration if anæsthesia is to be prolonged.

There are some individuals—usually children between the ages of five and fifteen—in whom the lachrymal gland appears to be unaffected by narcotics. In

these rare cases the absence of the secretion is evident during induction.⁶ The presence or absence of the lachrymal secretion is an important aid in differentiating the dilated pupil due to overdose from that due to impending vomiting. If the canthi have been kept dry, then their flooding with tears at the time of the dilatation of the pupil proves this to be due not to overdose but to impending vomit, and the anæsthetic must be at once increased.

Rectal Ether.—The value of rectal ether in selected cases is borne out by recent contributions.^{7,8} In exophthalmic goitre and for long operations on face, neck, and tongue, the method provides a most useful help, even if it cannot always be relied on to provide all the requisite narcosis. Properly used with several days' training of the patient by harmless saline injections per rectum, rectal ether is an excellent method by which to make use of Crile's idea of 'stealing the thyroid', and appears to give a very safe narcosis for those sufferers from exophthalmic goitre who are bad risks for general anæsthesia. It is important to allow time enough for anæsthesia to appear. Sometimes an hour is needed. If there is not anæsthesia by then, the addition of inhalation will be required. A preliminary hypodermic of omnopon and atropine should be made half an hour before the rectal injection. Most anæsthetists find that 6 oz. of ether is the maximum amount to inject, and use 5 or 4 oz. for women or slight subjects. It must be confessed that at present the exact amount needed cannot be estimated, and that the results are to some extent uncertain. We must keep, therefore, on the side of safety, and complete the anæsthesia by inhalation when necessary. Even so the rectal injection is of great service in the kinds of operation indicated. After-effects are little likely to give trouble if the rectum is properly washed out at the close of operation, and a couple of ounces of olive oil are left in the bowel. Success is most likely when the patient can be given 'practice injections' of saline per rectum once a day for two or three days before the operation, and the bowel must be washed out a couple of hours before the ether-oil injection is made. Children from one to twelve years of age are stated to have given very good results with rectal ether.⁷

Monod⁹ first realized the value of rectal ether when operation was required for a patient with multiple wounds of the lung and in hæmothorax. The impossibility of an inhalation anæsthesia was obvious, and local analgesia was hardly practicable because of the multiplicity of the wounds. Rectal ether provided all anæsthesia necessary for an operation lasting three-quarters of an hour, and no evil after-effects were experienced. This is a good example of conditions in which the rectal route provides almost the only satisfactory solution of the clinical problem of anæsthesia. The writer had thirty further equally satisfactory experiences. It is noteworthy that his first nine patients were given ether unmixed with oil and suffered no inconvenience. He gave the injection only twenty minutes before operation, a period which generally is hardly long enough for the full effects of the ether to manifest themselves.

In an article on *difficulties in the administration of ether*¹⁰ the writer commends Stang's test for the condition of the cardiac muscle. This consists in making the patient hold his breath for twenty seconds. Failure to accomplish this indicates the presence of acidosis or absence of proper cardiac compensation in the presence of a heart lesion.

Nitrous Oxide and Oxygen.—The popularity of this method for long operations has led to the exercise of much ingenuity in devising and improving operations. The best possible form is not yet attained in all probability, but we give an illustration of Boyle's¹¹ machine, which contains most of the important requirements, and which has proved its value in many hands (Fig. 1). This method of anæsthesia has a wide field, but it is above all one in which the careful selection of cases is most necessary to success. For

the operations of war surgery—operations largely upon the limbs of exhausted individuals—it was eminently well adapted, but there is danger of its earning unmerited abuse through its haphazard application to healthy individuals undergoing the abdominal operations of civil practice.

A simplification of the method by using air instead of oxygen has been successfully employed and described.¹² M. Desmarest has devised an apparatus¹⁴ for the administration of nitrous oxide and oxygen which carries out a new principle. He provides for the absorption of the expired carbonic acid gas instead of allowing it to be rebreathed or merely inhaled. At the suggestion of M. Amiot there is included in the respiratory circuit an hermetically sealed chamber containing liquid caustic soda which absorbs the CO_2 . Thus the necessity for completely emptying the bag in order to be rid of CO_2 is abolished, and the saving of N_2O thus achieved renders possible the use of small cylinders and a portable apparatus.

Some experiments on *subcutaneous anesthesia with ether and oil* carried out upon guinea-pigs are reported. A mixture was used of 85 per cent ether with 15 per cent olive oil, and the amounts required per 100 grms. body weight were found to be: maximum safe dose (anæsthesia of one to two hours), 0.74 c.c. ether; minimum dose, 0.46 c.c. ether.

In an article upon *anæsthesia in dental surgery*¹⁵ the author claims excellent results from a succession of oxygen (1 gal.), nitrous oxide, and ethyl chloride. The nitrous oxide is re-breathed, and during this time the ethyl chloride is gradually added. The blood-pressure is said to be unaffected, owing to the preliminary oxygen, and cyanosis to be absent. Details of the necessary apparatus are not given.

It is well established that occasionally collapse during anæsthesia which would otherwise prove fatal can be remedied by direct *Massage of the Heart*. Bost and Neve¹⁶ give a brief summary of the literature dealing with the emergency, and describe a new technique which the former employed with success. It is probable that not more than ten minutes should be allowed to elapse before massage of the heart is tried, if it is to be used at all. Effective artificial respiration with lowered head and abdominal compression must of course be given full trial for at least five minutes first. In the proceeding recommended, the abdominal incision is made 4 in. long in the mid-line from above the

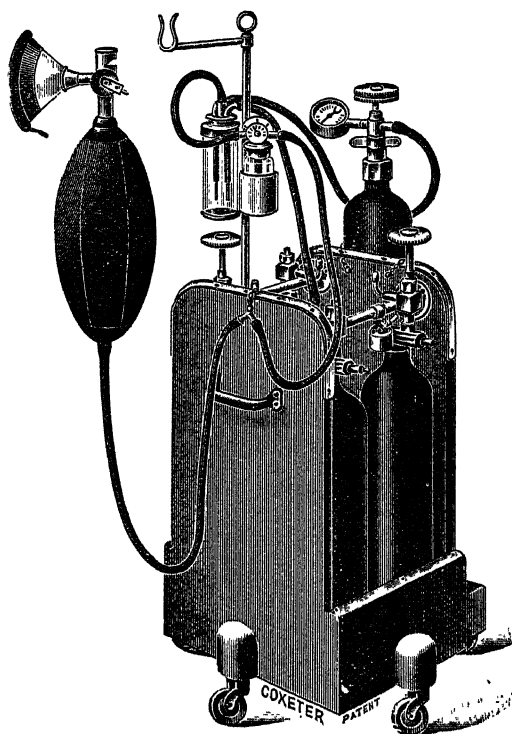


Fig. 1.—Boyle's apparatus for administration of nitrous oxide and oxygen.

umbilicus upward. The left costal cartilages are retracted, bringing in view the anterior diaphragmatic insertion. A pillow is placed under the waist. A 2-in. incision, beginning 1 in. to left of the median line and carried outwards behind the costal margin, cuts the fibres of the diaphragm near their insertion. A blunt instrument pushed in opens the pleural cavity, and the opening is dilated with fingers of the right hand so that the whole hand can be passed into the thoracic cavity anterior to the pericardium. The hand is passed up, the thumb behind the sternum and the fingers embracing the heart in the pericardium. The thumb compresses the right auricle and ventricle, and the base of the heart is effectively massaged. No vessels are injured in this incision. During the massage the parts can be pressed round the wrist of the operator so that air is not sucked in, and there is no tendency to collapse of the lung. It is asserted that intraventricular injections may be a useful addition to massage.¹⁷

General Anæsthesia for Operations upon the Face, Head, and Neck.—The different methods are discussed by Dufourmentel.¹⁸ He favours most the use of inhalation anæsthesia through a laryngotomy opening, with or without the aid of rectal ether. This method he finds more generally applicable than intratracheal insufflation, in which process the presence of a tube through the mouth occasions much inconvenience in all those patients in whom the operation requires interference within the buccal cavity. The special objects to be aimed at by the method of anæsthesia adopted for these cases are: (1) To keep the face free by placing the anæsthetist and his material at a distance; (2) To avoid entrance of blood into the air-passages; (3) To suppress vomiting. Preliminary laryngotomy renders possible complete packing of the pharynx. The laryngeal tube should be left in several hours after the operation, or else subcutaneous emphysema is apt to arise around the incision through the cricothyroid membrane.

Conductive Anæsthesia by the Intrascral Injection of Novocain ¹⁹ ('sacral anæsthesia').—This is being practised with increasing frequency. It is applicable to operations on the anus, perineum, rectum, and ureters. Perineal prostatectomy and cystoscopies have been successfully performed with the analgesia thus provided. Some uncertainty is at present the chief drawback to the method, which appears to offer an amount of safety superior to that of local injections in the anal region, and to spinal analgesia, in patients who are bad subjects for general anæsthetics. In order to make the injection, which consists of 20 to 30 c.c. novocain with 5 drops of 1-1000 adrenalin, the sacral hiatus must be first defined. The patient sits with the buttocks overhanging the edge of the table, or lies with the knees drawn up. A superficial injection is made to avoid the pain of introducing the larger needle used to perforate the membrane over the hiatus. To determine the position of the hiatus,²⁰ feel the tip of the sacrum, which usually lies just at the top of the anal cleft on the lowest prominent bony point of the spine. Then feel the tip of the coccyx in the anal cleft. Press the ball of the right index finger, pointing towards the patient's head, firmly against the back of the sacrum at its tip in the median line, and, without sliding the finger along the skin, work slowly up along the dorsal aspect of the bone. The finger will be felt to come into the apex of the inverted V which is formed by the sacral cornua (which bound the hiatus). The injection is to be made through the approximate centre of the hiatus. An area the size of a florin is painted with iodine, and one drop of novocain injected into the skin with a fine needle. Another drop is put into the membrane which occludes the hiatus, and which is well supplied with sensory nerves. The intrascral injection is made with a lumbar-puncture needle of medium calibre, equipped with a stylet and detached from its syringe. It is

held perpendicular to the plane of the back and pushed on until it meets the resistance of the fibrous membrane. The outer end of the needle is now carried towards the patient's feet through an arc of 90 degrees in the mid-line of the back, so that the needle comes to lie in the plane of the back, pointing toward the patient's head in the mid-line. It is then pushed straight up the back, and the piercing of the membrane may require a little force, and is accompanied by a characteristic 'crunch' which can be felt and often heard. The needle is pushed on about 2 inches. If at the first attempt the needle is not placed correctly, the best plan is to withdraw entirely and try again after carefully noting the markings of the hiatus. Superficial œdema after making the injection shows that the needle has not entered the sacral canal but lies superficial to it. When the needle has entered the sacrum correctly its point may catch in the periosteum. In this event the lateral mobility of the needle is lost and great force is needed to make the injection. No cerebrospinal fluid should appear.

Anæsthesia of the head and neck, chest, and arms, by **Intraspinal Injection**, is described by Riche.²¹ He claims perfect safety for his method, which differs from that of Jonnesco, and from the more recent procedure of Le Filliâtre. Both of these latter operators provided a form of anæsthesia that appeared too dangerous for general adoption. Riche uses **Novocain**, and injects 1 cgrm. for every 5 kilo. of body weight of the patient. The first or second lumbar space is chosen. He first allows 10 to 25 c.c. of cerebrospinal fluid to escape, then catches the fluid in his syringe which contains the novocain, and makes repeated slow injections of 1 cgrm. at a time, allowing one minute for every centigram. For operations upon the upper limbs when it is desired to avoid general anæsthetics, he prefers this method to that of infiltration. In 1200 instances the anæsthesia failed to mount high enough in only 12. The patient lies with the head low after the injection.

Spinal Anæsthesia.—The position of this method was well reviewed by Rood²² at the Royal Society of Medicine. The chief improvements which have greatly extended its use are its employment in association with general anæsthesia and with the Trendelenburg position. It has been clearly proved that the elevated position of the head and shoulders which used to be thought essential for safety is unnecessary and likely to lead to unduly low blood-pressure if persisted in for more than five minutes or so after the injection has been made.

The great value of spinal analgesia is that it greatly reduces the amount of shock associated with long surgical operations, and that it affords complete relaxation of abdominal muscles. Desplas and Millet²³ have shown that elimination of stovaine takes place by the urine, the greater part being got rid of within the first two hours and the whole within nine hours of injection.

Local Anæsthesia.—In a description of 250 major operations, Wiener²⁴ draws attention to the value of a new agent—**Apothesine**. This, like novocain, answers to the demands made of an ideal local anæsthetic, that it should: (1) Be non-toxic; (2) Produce durable analgesia; (3) Cause little local disturbance; (4) Be soluble in water, compatible with adrenalin, and sterilizable by heat. Wiener has used up to 12 grms. of apothesine at one sitting without any toxic symptoms or any interference with healing of the wound. The best results are obtained with fresh solutions. Apothesine is precipitated by alkalis and by the ordinary alkaloidal reagents. Chemically it is the hydrochloride of gamma-diethyl-amino-propyl cinnamate. It belongs, like novocain, to the ester group, and is made with propyl alcohol and cinnamic acid. It keeps well in tabloid form.

Fatal accidents with local anæsthesia are, of course, extremely rare. One is reported²⁵ just after an injection into the skin of the abdomen of $\frac{1}{2}$ per cent

novocain solution with 1-100,000 adrenalin. From the account, it is most likely that the adrenalin should be held responsible, as the instantaneously depressing effects of this drug upon the circulation when injected are well known. Combined with light chloroform narcosis it is of course so dangerous as to have been entirely abandoned in this connection, and when injected this must be done prior to any attempt at general anæsthesia. There was no question of general anæsthesia in the case alluded to, nor did the post-mortem throw light upon the catastrophe.

A useful form of *injector* is described, designed to overcome the difficulties sometimes met with when using the ordinary syringe in extensive operations, or when local analgesia is combined with gas and oxygen.²⁶ It is worked by means of an ordinary bicycle pump attached to a glass cylinder inside a graduated frame, and connecting with a tube on which is a valve controlling entrance of fluid to the needle.

REFERENCES.—¹*Arch. Inter. Med.* 1919, May, 61 and 636; ²*Virchow's Arch. f. Path. Anat.* 1889, 115, 1; ³*Jour. Exper. Med.* 1912, 15, 359; ⁴*Jour. Amer. Med. Assoc.* 1914, 62, 895; *Jour. Exper. Med.* 1915, 21, 1; ⁵*Lancet*, 1919, i, 792; ⁶*Ibid.* 793; ⁷*Jour. Amer. Med. Assoc.* 1919, i, 764; ⁸*Surg. Gyn. and Obst.* 1918, Dec., 461; ⁹*Presse Méd.* 1918, Dec. 9, 630; ¹⁰*Surg. Gyn. and Obst.* 1919, Jan., 34; ¹¹*Lancet*, 1919, i, 226; ¹²*Ibid.* 216 and 231; ¹³*N. Y. Med. Jour.* 1919, ii, 96; ¹⁴*Presse Méd.* 1919, Aug. 21, 457; ¹⁵*S. Afric. Med. Jour.* 1919, June 28, 179; ¹⁶*Ind. Med. Gaz.* 1919, Feb., 50; ¹⁷*Surg. Gyn. and Obst.* 1919, June, 470; ¹⁸*Presse Méd.* 1919, Feb. 13, 79; ¹⁹*Brit. Med. Jour.* 1919, i, 569; ²⁰*Med. Rec.* 1919, i, 991; ²¹*Presse Méd.* 1919, Ap. 28, 225; ²²*Lancet*, 1919, i, 14; ²³*Med. Press and Circ.* 1919, i, 354; ²⁴*Med. Rec.* 1919, i, 135; ²⁵*Surg. Gyn. and Obst.* 1919, May, 528; ²⁶*Brit. Med. Jour.* 1919, ii, 139.

ANAL ABSCESS. (See ISCHIORECTAL ABSCESS.)

ANGINA PECTORIS.

Carey Coombs, M.D., F.R.C.P.

Last year's ANNUAL gave reasons advanced by Chicago physicians for asserting a myocardial origin for anginal pain. A chief argument is that reiterated by Herrick¹, who describes the symptoms which he has found in association with coronary thrombosis. Briefly, the picture is that of an intense anginal attack, followed either by death or by physical signs which prove that some gross change has occurred within the myocardium. Prominent among these signs are pericardial friction, weakening of the heart sounds, increase in the volume of the heart, and inversion of the 'T' wave of the electrocardiogram. These observations were corroborated by various speakers at a recent meeting of British physicians. The inevitable inference is that cardiac pain is due to injury to the myocardium, at least in the severe attacks of which Herrick writes; and it seems probable that milder spasms are equally due to myocardial stimuli, of a similar kind though less catastrophic in degree.

The inference has two important bearings. It shows that there must be afferent paths from the cardiac wall itself. Further, it suggests that the most effective way of relieving angina may be by means of drugs which improve the circulation through the cardiac wall. Probably it is thus that the Nitrites relieve, and thus also may be explained the good results achieved in some cases by Caffeine and its derivatives.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, i, 387.

ANKYLOSTOMIASIS.

Sir Leonard Rogers, M.D., F.R.S.

C. A. Kofoid and M. A. Barber¹ describe a rapid and simple procedure for detecting ova in stools, which they call the 'brine flotation-loop method'. The stools are collected in 2-oz. paraffined paper drug-cans with tin bottom and paper top, which are one-third filled, and duly labelled, most conveniently with 'eternal' ink. They are then nearly filled with concentrated brine, and well stirred with separate rods in each. A circular filter of No. 0 or No. 1 long

fibre steel wool from $\frac{1}{8}$ in. to $\frac{1}{4}$ in. in thickness is pushed down through the fluid nearly to the bottom of the can to depress the coarser floating material. Discs of fine wire netting can be used, but are less satisfactory. After standing for one hour, nearly all the ova will be floating on the surface of the fluid, when about ten loopfuls of $\frac{1}{2}$ in. diameter, made with fine galvanized wire, are removed from the surface with the contained ova and placed on a slide, the surface of the fluid being focussed and rapidly examined with a low power of the microscope with the aid of a movable stage. All the common ova of intestinal worms, as well as entamoeba cysts, are thus easily detected, even when the infections are light. A trained man can complete from 150 to 200 examinations a day under average conditions. As a large amount of stool is used, the method is most accurate as well as simple, while it is twice as rapid as those requiring a centrifuge; there is very little glass, etc., to clean, and the materials are cheap. It greatly simplified the examination of troops in the United States.

D. J. Frick² reports on the examination of soldiers in the United States for hookworm, using Kofoed and Barber's method, which they found very satisfactory, only they accomplished the flotation of the ova in test-tubes 10 mm. by 10 cm., mixing a portion of faeces about one-third the size of an acorn with the brine, and removing the ova with a 5-mm. wire loop. They found ankylostoma ova in 11.5 per cent among white troops, mainly from hilly sandy soils, but only 1.1 per cent in coloured troops from the delta region. The eosinophil count was increased in most of the hookworm cases. Oil of *Chenopodium* freshly put up in capsules or given on sugar proved effective in the treatment. M. E. Barnes³ reports on a hookworm campaign in Siam for the Rockefeller Foundation, and found 77 per cent of 10,000 persons examined in Chiangmai to be infected. At the end of a year, out of 1512 re-examinations, only 197 were still infected. Latrines with lids to keep out flies have been successfully introduced in many places, and there is evidence of permanent results being obtained, while their use has also almost entirely eliminated dysentery and diarrhoea.

TREATMENT.—R. H. Knowlton⁴ deals with the treatment of hookworm disease with Oil of *Chenopodium*; he found that soft gelatin capsules from the manufacturer had an efficiency of only 68.5 per cent, as against 94.5 per cent with fresh oil put up in hard gelatin capsules, which are very soluble in water. He found the infection in United States soldiers to be usually light, and negroes to be less affected than whites. D. A. Roth⁵ in Panama observed toxic symptoms, chiefly deafness lasting from a week to several months, in 29 out of 103 cases treated. This oil should not be given in very anæmic cases, nor repeated within ten days.

H. H. Howard⁶ describes very fully an intensive campaign in British Guiana, in which limited areas at a time were dealt with very thoroughly, every inhabitant's stool being examined for hookworms, and all the infected being treated until proved to be cured, while sanitary improvements were also carried out to lessen the danger of re-infection—all under the control of the Rockefeller Foundation.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, ii, 1557; ²*Amer. Jour. Med. Sci.* 1919, i, 189; ³Report to Minister of Interior, Siam; ⁴*Jour. Amer. Med. Assoc.* 1919, i, 701; ⁵*Ibid.* ii, 1860; ⁶*Rockefeller Foundation, Hookworm Control*, No. 8, 1919.

AORTA, SYPHILIS OF.

Carey Coombs, M.D., F.R.C.P.

Hubert¹ gives an excellent summary of experiences drawn from 220 hospital cases, with notes on 80 others from the private practice of his chief, Romberg.

ETIOLOGY.—In 85 per cent of the cases tested the Wassermann reaction was positive. One quarter of the patients had symptoms of dorsal tabes, but not many had tertiary lesions. Hubert noted enlargement of the spleen in 26 per cent, a coincidence not hitherto recorded. In a majority of cases the symptoms

began between fifteen and twenty-five years after infection. Nearly all his patients were, therefore, 40 to 60 years of age. About two-thirds of the cases were men. The aorta seems to be attacked in about 15 per cent of all cases of syphilis.

PATHOLOGY.—As Hubert points out, the important thing to realize is, that the media of the aorta—its chief and special tissue—is directly attacked and injured. The muscle deteriorates, inflammatory areas are formed, and weak spots are thus developed in the aortic wall. Of the 220 cases, 118 are labelled as uncomplicated cases of aortitis, 54 of aortic insufficiency, 33 of aneurysm, while the remaining 15 are credited with coronary lesions in addition to aortitis. This estimate of the relative incidence of coronary changes is far lower than that of most writers, and does not appear to rest on a secure foundation.

SYMPTOMS.—Retrosternal pain or sense of pressure is the commonest of all symptoms, but even this was absent in a third of the cases. A greyish cachexia is often seen, according to Hubert. Accentuation of the aortic second sound is frequently the first sign of the disease, and aortic systolic murmurs are often heard. The systolic arterial pressure is not high as a rule, but the divergence between systolic and diastolic pressures is often abnormally wide. Skiagraphy early shows elongation and widening of the aorta.

PROGNOSIS AND TREATMENT.—Hubert gives a very bad account of his hospital cases, saying that they appear to die within eighteen months of the onset of symptoms, while the private cases survive about twice as long. This low standard detracts a little from the force of his argument that early and vigorous treatment will materially prolong life; neither can we agree that skiagraphic comparisons can be relied on as proof of reduction in the size of an enlarged aorta under antisyphilitic treatment. Nevertheless it is true that a more optimistic attitude than prevailed a few years ago seems to be justified, and all patients with aortic syphilis should be given the benefit of treatment (as early as possible, of course) with **Salvarsan**, preferably, as Hubert says, in one of the forms readily soluble in water.

[The writer is convinced of the need for **Mercury**, and **Potassium Iodide** in most cases.—C. F. C.]

REFERENCE.—¹*Deut. Arch. f. klin. Med.* 1917, 317.

APPENDICITIS, CHRONIC.

Robert Hutchison, M.D., F.R.C.P.

Cheney¹ believes that chronic appendicitis is not so commonly a cause of ill-health as is often supposed, and that it is too often suspected as an explanation of obscure digestive ailments. This has been remarked before, but there is no harm in having it stated again. In the diagnosis of the genuine cases a careful history is of value, although an absence of a history of a previous acute attack does not exclude chronic disease. Some cases are apparently chronic from the outset. Pain, especially if aggravated by movement and accompanied by local tenderness, is suggestive. It may be referred to the right lower quadrant, or vaguely to the abdomen as a whole. On the other hand, absence of pain on palpation does not exclude appendicular disease. Test meals are of little help. X-ray evidence is of great value, though a diseased appendix may fail to show up because it is behind the cæcum or because it is obliterated and cannot fill. On the other hand, localized tenderness on screen-examination, kinking, irregularities in lumen, delayed emptying, and evidence of adhesions, all constitute positive proof of abnormality.

Spriggs,² in an excellent and well-illustrated paper on the examination of the vermiform appendix by *x* rays points out its value in chronic appendicitis. (See also pp. 18, 23, 46.)

Grégoire,³ in a paper on 'pseudo' chronic appendicitis, remarks that "there

are few symptoms so difficult to interpret as pain in the iliac fossa". The appendix may be removed without curing the pain, and he relates eight cases in which the appendix could be exculpated. Membranous pericolicitis can sometimes be incriminated. The vascular membrane that develops encloses the colon in a sac that is too short for it, and the colon has to bend. If a congenital origin for the membrane is accepted, then we can assume that the colon has been impeded in its growth. The colon folded in on itself does not allow free passage of its contents. Between two angulations the loop becomes distended and painful, and stasis results. Relief can come only from releasing the colon from its hampering membrane, and fastening it so that it cannot fall into the old bends again. In his cases he secured the right portion of the transverse colon to the anterior abdominal wall. The subhepatic angle was opened wide by this procedure and the normal passage of faeces insured. The cure has been complete and permanent in one for seven and one for four years among his eight patients treated by this means. The others are comparatively recent cases or have been lost to sight. The pains had persisted after removal of the appendix in four. In the others the abdominal attack had simulated acute appendicitis, but the membranous pericolicitis or Jackson's membrane had been recognized and corrected at the laparotomy. In these cases of constricting bands and membranes, the paroxysmal pain may suggest appendicitis, but the temperature and pulse keep normal during the attack, and the abdominal wall does not stiffen. Some of the bismuth meal was retained in the caecum in one of his cases for sixty-four hours. The distention of the right colon is also characteristic, and its outline is smooth and roundish, the caecum end larger than the rest. The ascending colon and the transverse colon may lie like the barrels of a gun, but the kink is movable. The dilatation of the origin of the large intestine is an argument against the assumption that mere movability of the caecum is responsible for the disturbances. The small intestine is naturally extremely movable, but this does not induce dilatation and pain. Neither the movability nor the ptosis explains the lesion. The decisive factor is the obstacle, against which the bowel beats and exhausts its muscular tonicity in vain. When it is released from this, the disturbances subside.

For the employment of **Glucose** (*see p. 7*).

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1918, ii, 494; ²*Arch. of Radiol.* 1919, March; ³*Abst. in Jour. Amer. Med. Assoc.* 1919, ii, 290.

APPENDICITIS AND THE PELVIC ORGANS.

W. E. Fothergill, M.D.

C. G. Child¹ has analyzed 746 cases of laparotomy for gynaecological conditions, and states that the appendix was 'pathological' in 244 cases (32.57 per cent).

The complication naturally appeared most frequently in infective cases, and was most common in infections affecting the right side. The appendix was but rarely the primary source of infection. Co-existent involvement of the appendix and the right adnexa is so frequent that it is a safe rule always to examine the condition of the one when operating on the other. The gynaecologist investigates the condition of the appendix as a routine, and usually removes it on the slightest suspicion; but the general surgeon in doing an appendicectomy, if he invades the pelvis at all, is usually satisfied with breaking up adhesions, and thus many times removes the appendix when it is only secondarily involved. Only too often is his field of vision limited by the inadequate incision used, and his field of operation by his unfamiliarity with gynaecological pathology.

REFERENCE.—¹*Amer. Jour. Obst.* 1919, July, 31.

APPENDICITIS, SURGICAL TREATMENT OF.

E. Wyllys Andrews, A.M., M.D., F.A.C.S.

Brun¹ calls attention to the fact that the objective signs of appendicitis are often referred to the right lumbar region. Anatomists tell us that 13 to 16 per cent of appendices are retrocaecal. The experience of surgeons, however, is that 30 to 40 per cent of those requiring operation lie in that region. In about 30 per cent of his cases he has been able to elicit a point of sharply localized tenderness just above the middle of the right iliac crest in the external angle of Petit's triangle. Spasm of the muscles of the posterior abdominal wall can also be elicited about this point.

Irwin² has undertaken a classification of the clinical types of appendicitis and a correlation of this with the pathology. He divides them into cases of true appendicitis and those of appendicular obstruction. The first group includes 84 out of 131 cases. Clinically they are marked by an indefinite onset. Pain is not an early symptom, and is definitely localized from the beginning in the right iliac region. The pain is continuous and dull, and is not so severe as in the obstructive type. There is a marked elevation of temperature and pulse from the beginning. Constipation is absent as a rule. The second type he divides into three stages (*Plate VI*): *Stage I*, Obstructed only; *Stage II*, Obstructed and gangrenous; *Stage III*, Obstructed, gangrenous, and perforated. The obstruction may be caused by concretions, kinks, strictures, bands, or foreign bodies. Clinically, the onset of the second type is marked by pain, generally diffuse at first. In *Stage I* there are few or no signs of infection, no leucocytosis, temperature 99° or less. The pain is intermittent and colicky in character, and the patient feels comfortable in the short intervals. There is no muscle spasm, and only slight local tenderness. Laparotomy at this stage reveals no signs of inflammation—merely an obstructed appendix with slight hyperaemia. In *Stage II* there are added to this picture mild signs of infection. The temperature is 100° to 101°. Pain is more constant and better localized, and often less severe. Vomiting is present as a rule. Tenderness is more marked, and there is some local muscle spasm. Operation at this stage reveals gangrene, total or partial, of the appendix, but no perforation. *Stage III* shows an aggravation of all the symptoms. The right rectus is rigid throughout, and there is a mass palpable. At operation, a gangrenous, perforated appendix with abscess formation is found. [We are struck by the large percentage of cases which had gone on to abscess formation in the series reported by Irwin (50 per cent), and in the statistics quoted by him from other British hospitals. La Roque reports a series of 600 cases with 102 perforations, and that about represents our own experience. Does this discrepancy mean that an American with abdominal pain is more prompt in consulting a surgeon, or is it due to differences of virulence in the infecting organism?—E. W. A.]

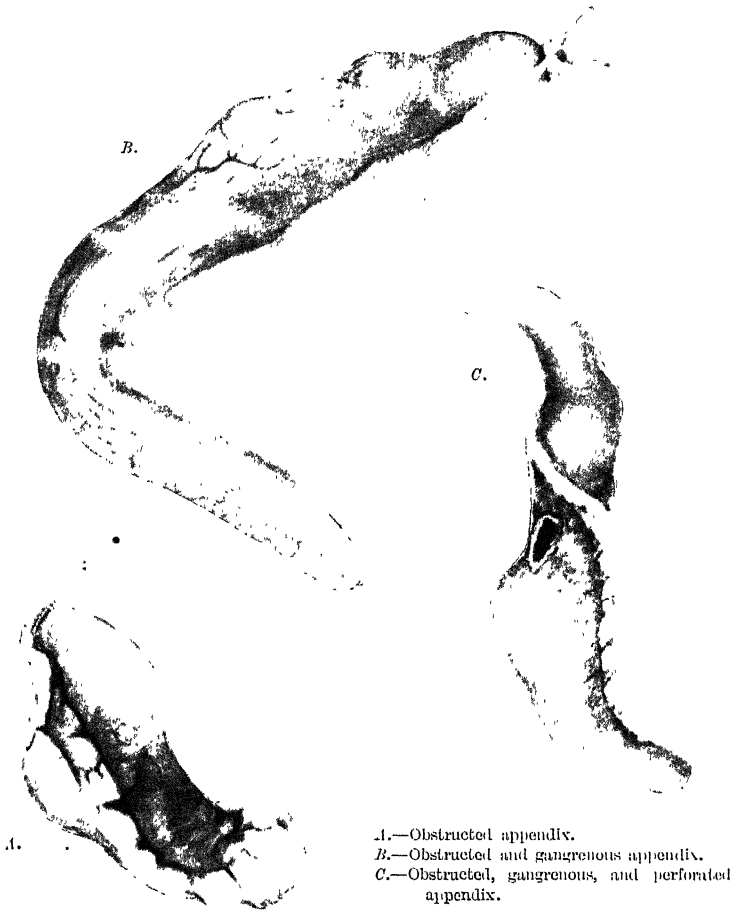
With reference to the point just referred to, it is interesting to note that in several army camps there were noted an unusual number of cases with insidious onset and mild clinical manifestations, but which proved at operation to be ruptured. McKenna³ suggests the possibility that this may be due to the triple typhoid inoculation, and has demonstrated a slight degree of leucopenia following inoculation. The recent epidemic of influenza also suggests itself as another factor.

Spriggs⁴ points out the valuable data which the *x* ray may give in chronic appendicitis. The normal appendix fills and empties at the same time as the caecum. It may, especially in young people, fill and empty repeatedly while the caecum remains full. In determining whether an appendix is diseased or not, attention must be paid to filling and emptying, shape, mobility, position, and the presence of concretions, hyperactivity, spasm,

PLATE VI.

ACUTE APPENDICITIS AND ACUTE APPENDICULAR
OBSTRUCTION

(S. T. IRWIN)



A.—Obstructed appendix.
B.—Obstructed and gangrenous appendix.
C.—Obstructed, gangrenous, and perforated appendix.

By kind permission of 'The Lancet'

or tenderness. Continued contractions or spasm are associated with acute inflammation.

REFERENCES.—¹*Presse Méd.* 1919, Jan. 16, 23; ²*Lancet*, 1919, i, 98; ³*Surg. Gyn. and Obst.* 1919, March, 303; ⁴*Lancet*, 1919, i, 91.]

ARTERIAL TENSION, HIGH.

Carey Coombs, M.D., F.R.C.P.

Certain of this year's papers enable us to give some sort of an answer to two highly important questions.

1. What constitutes a high blood-pressure? Enebrücke,¹ who has devoted much time to the measurement of blood-pressure in normal and insane persons, says the normal maximum (systolic) pressure in young adults is between 140 and 150 mm. Hg. This is rather a rigid statement, but is worth remembering, because it will prevent diagnoses of 'hypertension' based on the discovery of a systolic pressure of 150 mm. L. Thorne Thorne,² using the auscultatory method, finds that a minimal or diastolic pressure of 90 mm. or less is proof positive of the absence of arterial degeneration; exceptions of course being found in some cases of aortic incompetence, chronic mitral disease, and senile atheroma. If we put these two statements together, we may say that the systolic pressure ought not to be above 150 nor the diastolic pressure below 90 in the third and fourth decades.

2. What causes high arterial tension? Probably different things in different people. For example, Riesman³ and Hopkins⁴ describe what the latter calls *climacteric hypertension*. Riesman's account of it is so good that it must be freely quoted. His patients were women of 50 or so, stout, overfed, constipated, multiparæ, subject to worry of various kinds, and at the menopause. Slight fever is often noted. The average pressure in his group was 211 mm. Hg systolic, 105 diastolic. The urine is normal, or at all events not far from it. The heart is enlarged, but the cases run a benign course. Some, however, terminate in angina, apoplexy, or decompensation. In handling these patients we should avoid vasodilators, but try rather to remove causes. To this end he has used *Corpus Luteum* extract with good effect. He also advises light diet, and lays much stress on the neutralization of worry, not by a mere futile injunction, 'Don't worry', but by patient analysis of the causes of worry and conversion of the patient to a more philosophic attitude. A good prognosis should always be given.

With much of this Hopkins's account agrees. He lays less stress on the importance of many gestations as a causal agent, and makes much of a probable endocrine factor. But in their main argument they are at one; in women (more than in men) there is a climacteric type of high tension, benign in its course, not caused by renal disease, and aggravated even if not provoked by emotional stress.

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1918, i, 272; ²*Pract.* 1918, ii, 260; ³*Jour. Amer. Med. Assoc.* 1919, ii, 330; ⁴*Amer. Jour. Med. Sci.* 1919, i, 826.

ARTHRITIS. (See also RHEUMATOID ARTHRITIS).

Herbert French, M.D., F.R.C.P.

ETIOLOGY.—Roland Hammond¹ emphasizes the need for wider use of *x* rays in the detection of certain diseased conditions of the *teeth* which are considered to have an etiological relation to arthritis—especially in locating abscesses around the apices of non-vital teeth. Such infections may occur without pain, and without clinical evidence of their presence until such time as their contents find an outlet, for instance by way of the antrum, or in the form of a gumboil. There are, of course, minute abscesses which the *x* rays fail to detect because the pus is thinly distributed, or because the bone has not been robbed of its lime salts sufficiently to make this loss clear on the skiagram. The first positive

appearance is a small area of slight bone rarefaction round the root apex. At the same time it is important to realize that the interpretation of dental skiagrams is full of pitfalls. Serious errors may be made unless one is familiar with dental anatomy and pathology and the varying appearances of shadows in skiagrams taken from different angles. Thus, it is possible to take a skiagram from such an angle that what appears to be a typical apical abscess is apparently demonstrated; a plate or film made from a slightly different angle may disclose only the normal bone surrounding the tooth apex. The reason for this error lies in the fact that at certain angles the shadows of the nasal cavity or antrum may overlie the tooth root and simulate the appearances of an abscess. In spite of this, however, the x rays have a very real value in detecting or confirming the existence of deep-seated tooth-socket disease, such as may be the primary origin of arthritic changes or rheumatic pains in cases of otherwise obscure origin.

TREATMENT.—The curious way in which the **Intravenous Injection of Protein** benefits—even if it does not cure—certain cases of infective peri-arthritis and arthritis, especially perhaps gonococcal arthritis, is a relatively new discovery. Amongst others, Brooks and Stanton² report very favourably of it. The protein may be made up in sterilized ampoules ready for use, or the ordinary antityphoid vaccine (T.A.B.) may be employed for the same purpose, not because of the antityphoid products in it, but because of the concomitant protein bodies which are formed in it during its preparation. Either the peptone solution or the T.A.B. injection is given intravenously with a sterile needle and suitable syringe; and although there is no dosage which is as yet recognized as the best, one may give the equivalent of 500 million mixed typhoid and paratyphoid bacteria at the first dose, repeating either this dose or more at the end of a week, with a third dose a week later. Alternatively one may give from 10 to 60 mgrms. of pure protein dissolved in sterile normal saline in a similar way. It is reported that the constitutional reaction is less when the protein solution is used than when the T.A.B. vaccine is employed. With the latter the patient's temperature during the twenty-four hours succeeding the injection may rise to as much as 108° or more, and the patient may have a rigor and feel headachy and ill; but this reaction soon subsides, and generally is much less after succeeding injections than it is after the first. The improvement in the joint condition may appear within a week; occasionally it is very marked, notably in subacute gonococcal cases; but more generally, the effect is rather an alleviation than an actual cure. It is, however, distinctly useful and worthy of further trial in suitable cases.

The general idea underlying the treatment is that when the foreign protein is thus injected intravenously, the body as a whole reacts and, in the process of the anti-protein reaction, produces substances which in their turn militate against the harmful effects of microbic toxic substances already in the body. In a gonococcal case the intravenous protein injections have no effect upon the urethral discharge itself, nor do they lead to any mitigation in parts which are permanently fibrosed. It is the subacutely active peri-arthritic lesions which are most influenced for the better by the injections.

For the use of **Mercuric Chloride** (see p. 10).

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1918, ii, 541; ²*N. Y. Med. Jour.* 1919, i, 452.

ASTHMA, BRONCHIAL.

Arthur Latham, M.D., F.R.C.P.

Chandler Walker¹ gives further proof of the fact that asthma is due in different individuals to a sensitiveness to a particular protein. Asthma occurring only in summer is usually due to the protein of pollen; when it occurs only in winter it is usually due to bacteria. Of the 400 cases studied, 191 were

found to be sensitive to cutaneous inoculation with protein ; thus, 78 patients reacted to the proteins in animal hair, 68 to those in food, 33 to those in bacteria, and 92 to those in pollen, many patients reacting to more than one variety of these proteins. From 50 to 90 per cent of the patients who first had asthma at various ages under thirty-five gave positive reactions ; none of the 20 over fifty years of age did so. Of 34 patients whose asthma began before they were two years old, 19 were sensitive to the proteins of animal hair (horse-hair alone, 10 ; cat-hair alone, 1 ; hair of horse, cat, and dog, 8), 23 were sensitive to food protein, 5 to bacterial protein, and 15 to the protein of pollen. Out of 68 patients sensitive to food proteins, 35 were sensitive to cereal grains (wheat alone, 25 ; maize alone, 3 ; rice alone, 2 ; wheat, maize, and rice, 5), 13 to egg, 5 to casein, 8 to fish, and 7 to potato. Of the 92 cases sensitive to pollens, 17 were sensitive to early pollens (chiefly timothy grass), 45 to late pollens (chiefly ragweed), the remaining 30 to both sorts. Multiple sensitization to pollens was commonest in those whose asthma began in infancy. It was also shown that the four chief sources of protein poisoning were animal hair, food, bacteria, and pollens.

In another paper Walker² discusses the results of treatment of bronchial asthma in sensitive patients with the Protein to which they were sensitive. Of the 48 patients who were sensitive to and treated with horse-dandruff proteins, 63 per cent were relieved of asthma, 10 per cent have had too little treatment to warrant a prognosis, and 20 per cent were relieved by vaccines or by omitting foods to which they were sensitive ; in the remaining 7 per cent of this group, treatment was a failure. Of the 4 patients who were sensitive to and treated with cat-hair protein, 3 were relieved of asthma, and the other patient, who was equally sensitive to the horse-dandruff proteins, was relieved by treatment with them. Of the 30 patients who were sensitive to the cereal grains, 74 per cent were relieved by the omission of these from the diet, and 7 per cent were relieved by vaccines ; of the 26 per cent who were not relieved by the omission of cereals from the diet, in 16 per cent there was no evidence that cereals played any part in the cause of asthma, but the presence of eczema may account for these positive skin tests. Of the 33 patients who gave positive skin tests to other foods, 50 per cent were relieved by the omission of these from the diet ; 30 per cent more were relieved of asthma, but as the latter were also sensitive to other proteins which were also omitted from the diet at the same time, it is difficult to give credit to any special protein ; the remaining 20 per cent were not relieved of asthma, but the presence of eczema and urticaria and an acquired distaste for certain foods probably explains the idiosyncrasy. Therefore, of the total number of 100 sensitive individual patients who were treated as indicated by the positive skin tests, in 75 per cent there was relief from asthma ; in 14 per cent, although there was no relief from asthma, there was a definite idiosyncrasy substantiating the positive skin test ; but in 11 per cent the positive skin test had no apparent bearing on the patient's condition, although in only half of these, or 5 per cent, was there evidence that the skin test gave a false result. Since the 11 per cent includes 7 per cent who were relieved by vaccines, a total of 82 per cent of the sensitive patients were relieved from asthma.

In yet another paper Walker³ makes a further series of investigations with regard to the effect of Pollens on bronchial asthma. He comes to the conclusion that patients who have seasonal bronchial asthma caused by pollens are prevented from having asthma by a series of treatments with the pollens to which they are most sensitive, provided sufficient treatment is given, and by this is meant a series of treatments consisting of various dilutions of the pollen protein ranging from the strongest dilution which fails to give a positive

cutaneous test, to the strongest dilution which gives a positive test. The proper treatment is as follows : 1-10,000, give 0.2 c.c. ; 1-5000, give 0.2 c.c., 0.3 c.c., 0.4 c.c. ; 1-1000, give 0.2 c.c., 0.3 c.c. ; 1-500, give 0.2 c.c., 0.3 c.c., 0.4 c.c. ; 1-100, give 0.1 c.c., 0.2 c.c., 0.3 c.c. Treatment with pollens during the season is less reliable, but worth doing provided much treatment preceding the season fails or cannot be given. In such cases very small amounts of the pollen protein should be given.

William C. Thro⁴ holds that it has been definitely established that asthma is due in over half the patients to a sensitization to protein, and discusses certain aspects of the questions raised. It was ascertained by study that the Californian native black walnut was probably responsible for a considerable amount of hay fever in that State. The patients were tested by the intradermal method with extracts made from walnut pollen, and a number of positive reactions were obtained. All the individuals used as controls were negative. A number of patients were relieved by leaving the regions where the walnuts abound during the season of pollination. Many of the patients are being treated with the pollen extracts, but the results have not yet been announced. Patients sensitive to proteins of horse dandruff, dog's hair, cat's hair, and pollens are relieved by a process of desensitization. It is unfortunate that the effects are transitory, especially with hay fever, and that consequently every year the patient has to go through a series of prophylactic inoculation before the appearance of the causative pollen. In desensitization the patient is given a set of injections with gradually increasing amounts of pollen protein. These amounts are accurately ascertained by R. A. Cooke and Vander Veer by determining the amount of total nitrogen which the doses contain. With patients sensitive to food proteins, it seems that the only resource is in abstinence from the foods which cause disagreeable reactions. That something, however, is possible in the way of desensitization to food products is apparent from the excellent work done by O. M. Schloss. His immunization was accomplished by the use of capsules given internally and containing, not the whole substance, but one of the isolated proteids. His results were very satisfactory. It seems to be the consensus of opinion of several investigators that a few of the patients are relieved by injections of *Vaccines*.

A clinical study by Francis M. Rackemann⁵ of 150 cases of bronchial asthma leads him to the following conclusions :—

1. 'Bronchial asthma' is a symptom of some other diseased condition.
2. One hundred and fifty cases of asthma can nearly all be divided, according to the etiology of their attacks, into various sub-groups under the general headings of 'extrinsic asthma' and 'intrinsic asthma'.
3. Extrinsic asthma includes 28 per cent of the entire group ; intrinsic asthma includes 53 per cent ; the other 19 per cent being unclassified.
4. The age at onset of extrinsic asthma averages about 12 years, while the age at onset of intrinsic asthma averages about 26 years.
5. A history of either asthma, hay fever, or food poisoning, in the immediate family, occurs in 58.7 per cent of the cases of extrinsic asthma, but in only 10.5 per cent of the cases of intrinsic asthma.
6. Skin tests are of great assistance in confirming the diagnosis.
7. Skin tests alone are of no value unless reasonably compatible with the patient's history or experience.
8. A positive skin test is a necessary preliminary to successful specific treatment.
9. The 'nervous' element is very important in asthma, but probably does not explain why certain individuals have asthma.
10. The percentage of eosinophilic leucocytes in the blood is increased in

asthma; the degree of this increase is not different in extrinsic or intrinsic asthma, nor does it vary during and between the attacks.

11. Treatment resolves itself into the treatment of the exciting cause. Various different therapeutic procedures sometimes yield favourable results; but these cannot be explained.

12. The real problem—What is the fundamental disturbance of anatomy or physiology which expresses itself by attacks of asthma?—remains unsolved.

Besche⁶ has reported his observations on a man who, after a prophylactic dose of diphtheria antitoxin, developed extreme respiratory distress and collapse resembling in every respect acute anaphylactic shock. On recovery it was elicited that as far back as he could remember the patient had had asthmatic attacks following exposure to exhalations from horses in a stable or circus. This idiosyncrasy, which was absent for about four months after his experience with antitoxin, recurred again after eating a sausage which was proved by the precipitin test to contain horse-meat. He had observed himself that if he stroked a horse and then placed his finger against his conjunctiva, a redness, lachrymation, sneezing, and catarrh were produced within five to ten minutes and lasted one hour. Experiments were undertaken upon him, and it was found that a minute quantity of horse serum applied to a trivial scarification of the skin resulted in a few minutes in the production of a wheal 2 cm. in diameter. The injection into guinea-pigs of 5 c.c. of the man's serum was capable of transferring the anaphylaxis passively, for on a subsequent inoculation of the animals with normal horse serum, typical anaphylactic shock was induced. Asthmatic attacks were observed to follow exposure to the exhalations of horses, but none to those of cattle, sheep, goats, dogs, or cats. Slighter symptoms were seen on exposure to rabbits and guinea-pigs, but the sera of these animals did not produce wheals when applied to the slightly scarified skin. Besche then undertook observations on 31 other cases of asthma, and found 11 owed their attacks to exposure to equines and 1 to exposure to cats, although these patients were unaware of the fact. Some had suffered from early childhood. In others the idiosyncrasy manifested itself from 10 to 18 years of age. All the eleven were typical and specific 'horse asthmatics', as proved by the conjunctival or cutaneous lesion following the application of equine exhalations or serum. According to the prevailing anaphylactic theory, it is to be presumed that these equine products were antigenic, reacting with some antibody and complement in the patients to produce the observed symptoms. This was borne out by the production of passive anaphylaxis in the guinea-pig, as detailed above. The danger of injecting such idiosyncratic persons with antitoxins is obvious.

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1918, clxxix, 288; ²*Arch. Internal Med.* 1918, Oct., 466; ³*Amer. Jour. Med. Sci.* 1919, March, 409; ⁴*N.Y. Med. Jour.* 1919, March 22, 500; ⁵*Arch. Internal Med.* 1918, Oct., 517; ⁶*Berlin klin. Woch.* 1918, xxxviii, 902.

ATAXIA. (See also HYSTERIA AND ORGANIC AFFECTIONS OF THE NERVOUS SYSTEM.)

J. Ramsay Hunt, M.D.

TREATMENT.—Much may be accomplished by the systematic use of re-educational methods. Fraenkel, a number of years ago, devised a system for the treatment of the tabetic which had great vogue at the time, and occupies a permanent position of usefulness in the treatment of locomotor ataxia. Foerster, of Breslau, still further elaborated this method, and applied it to a variety of motor disorders. In recent years Maloney has re-investigated the problem, and has made certain additions to the method which are novel and apparently of advantage. M. Grossman¹ describes his experience with the Maloney method of treatment as follows:—

This method of treating tabetic ataxia is based upon the thesis that perfect

thinking is essential to perfect moving; and that perfect moving is the outward sign of perfect thinking. There is a psychological as well as a physiological element in all symptoms, in all disabilities. This is especially true of the symptoms and manifestations of locomotor ataxia. Psychological treatment is, therefore, as essential as physiological treatment.

The deterioration of attitude in tabes is due in part to anatomical, but mainly to mental, causes; and as such it is readily influenced by proper therapy. As an aid to the rapid correction of faulty attitude, and to prevent as much as possible its aggravation, Maloney has introduced into his method of treatment the temporary use of mechanical measures in the form of plates for the correction of defective arches, shoes and braces to counteract weak and hypotonic muscles; the mental state of fatigue and fear is combated with 'rest exercises'; and lastly, he has introduced blindfolding into his method as a measure to decrease external distraction, thereby allowing greater concentration and more intensive application for interpreting the delayed, imperfect, postural images that result from interference in conduction of sensory stimuli.

'*Rest Exercises*'.—A quiet room, preferably darkened, with a bed or couch wide enough to keep the patient's arms from hanging over the sides when relaxed, a small cushion for his head, and a metronome to regulate the time, are the only appliances required. The patient, in a recumbent posture, with the clothes about the chest and abdomen loosened, is instructed to breathe deeply and to pause at the end of inspiration and expiration. After a few deep respirations, the patient passes to breathing of moderate amplitude, and later to gentle breathing. The breathing is abdominal in type, slow in rate, and uniform in rhythm. Distracting thoughts are stopped as they arise, and his attention must be kept fixed on the sensations that accompany his breathing. A bag of shot or sand placed on the abdomen increases the muscular effort, so that the breathing may not readily lapse into an unconscious act.

Then muscular relaxation is procured. To induce this state, the muscles are passively moved at each joint. The muscles of the scalp, forehead, eyelids, and jaw are passively moved, until wrinkling, and blinking of the eyelids, diminish and disappear, and muscular spasm has been reduced or eliminated. Next a shoulder is relaxed, then an arm; each in turn must be passively moved until muscular spasm vanishes and the part lies motionless and flaccid and falls limply from any unsupported position. The trunk should be slowly bent backward and forward and from side to side, until the muscles are relaxed and allow the trunk to gravitate without restraint in whatever direction it is inclined, unsupported.

Throughout the passive movements the physician periodically corrects the breathing, slows it as it quickens, insures adequate pauses at the end of inspiration and expiration, and encourages rhythmic movements. The objective guide to success is the behaviour of the eyelids. When the patient is well relaxed, the eyelids are still, the pulse-rate has slowed, and the blood-pressure has fallen; when quivering of the eyelids returns, the patient is uncomfortable or distracted, the pulse-rate is increased, and the blood-pressure has risen. The training usually begins with several 10-minute exercises, separated by short intervals. As the patient learns, the exercises may be increased to 45-minute periods. The easier the patient learns, the less is the strain upon him, and the more pronounced is the relief of his muscular, vascular, and mental tension. The tabetic thus trained to rest is endowed with the necessary preliminary to all effort—the power to recuperate. Treatment may now be directed toward training his cerebral control. All movements must be accurately defined and precisely performed; they must be carefully regulated in their time relations by means of the metronome. The training in the rest

exercises is itself the beginning of the training in attention and in sustained and controlled effort.

After analyzing and measuring the disturbance of movement present in a given case, and after adopting such measures as are indicated to prevent the further aggravation of the disordered movement, one can begin to cure it. Impulses from the muscular apparatus and from the labyrinthine organ are constantly exciting in the cerebral cortex kaleidoscopic postural images of the whole body, always changing, yet always related. Of the majority of these images we are unconscious. We are usually conscious, not of the postures of the various parts of the body, but only of their combined effect, of our relation to our environment. On account of imperfect, delayed, and feeble images and after-images, which may be the only ones available where the sensory pathways have been interfered with, most tabetics, misled by them, eventually suppress them altogether and learn to guide and correct their faulty movements by means of their vision. They become visual automata, and unless they carefully scrutinize their movements they cannot move. To obviate this, Maloney introduced blindfolding into his method of mental training. Blindfolding assures attention to these imperfect, delayed, and feeble images, as they are the only ones available, when co-ordinate movement is being taught. Blindfolding also decreases competition for attention between postural images and images derived from other sensory fields; it also reduces external distraction to a minimum.

To avoid fatigue the exercises must involve a minimum effort. Relaxation must be freely practised during the periods of work; these periods should rarely exceed one hour. When the tabetic is mentally and physically competent to move co-ordinately in spite of all ordinary emergencies under sheltered conditions, his activities should be broadened. He should be taught to walk freely and unaided in public, at street crossings, and at changes of level and surface.

With this method of treating ataxia, Grossman was able to return to a non-ataxic state 12 of 15 cases which were reported. For details of the method the original monograph of Maloney should be consulted (*Rev. Neur. and Psych.* July, 1911).

REFERENCE.—¹*Med. Rec.* 1919, 268.

BERI-BERI. (See also DEFICIENCY DISEASES; VITAMINES.)

Sir Leonard Rogers, M.D., F.R.S.

ETIOLOGY.—F. M. R. Walshe¹ records a brief clinical study of 40 cases of beri-beri from Mesopotamia seen at Alexandria, and discusses at length the causation of the disease. He quotes recorded experiments to show that, in addition to the absence of vitamins, the presence of certain food substances in excess, namely carbohydrates, is essential, and suggests that under these conditions toxic substances are produced during the metabolism of these carbohydrates, and that vitamins are most closely related to enzymes. Riddell, Smith, and Gutierrez² describe the first cases of beri-beri recognized in Porto Rico in the men of a regiment whose diet was deficient in fresh vegetables and meat and contained a relative excess of rice. N. T. Abdou³ records the affection with beri-beri of the crew of a vessel after a voyage of 85 days without fresh food. The exception was the skipper, who kept the only good food for himself.

REFERENCES.—¹*Quart. Jour. Med.* 1918, July, 320; ²*Jour. Amer. Med. Assoc.* 1919, i, 569; ³*Ibid.* 1918, ii, 1295.

BILHARZIASIS.

Sir Leonard Rogers, M.D., F.R.S.

F. W. Cawston¹ records further work on bilharziasis in Natal, where he has demonstrated *Bilharzia cercariæ* in the snail *Physopsis africana*. Animals could not be infected. Filtering the water-supply, or straining it through

copper ribbons to remove the snails, prevents infection. No treatment was of any use, but the disease is very rarely fatal or serious in South Africa.

TREATMENT.—J. B. Christopherson^{2,3} records great benefit in bilharziasis in the Sudan from the intravenous injection of *Tartar Emetic*, as successfully used in kala-azar. He reports 11 cases in his first paper and one in the second, and where the treatment was persisted in, the symptoms disappeared and the ova either completely disappeared or became greatly reduced in the urine. He advises a course of from $\frac{1}{2}$ - up to 2- or 3-gr. doses, given every other day over 15 to 30 days, and pushed up as rapidly as possible to the full dose, given with due caution owing to the toxicity of the drug. Although further experience is necessary, he thinks it may prove to be a cure for the disease. C. J. Wiley⁴ reports a case treated on the above plan in which the symptoms cleared up after ten injections and the patient remained well for several months. R. G. Archibald and A. Innes⁵ report a case of bilharzial disease in which the patient died of acute influenza, and a post-mortem showed that the adult worms had disappeared from the abdominal vessels as a result of the antimony injections. They also describe degenerative changes in the liver and kidney which they attribute to the antimony treatment, from which view Christopherson⁶ dissents. G. C. Low⁷ also reports one successful case under the antimony treatment.

J. B. Christopherson^{8,9} records further experience of antimony tartrate, and attributes symptoms of tachycardia after the drug to previous debility due to various intestinal parasites, including *Tænia nana*. In a further paper with J. R. Newlove,¹⁰ notes on 70 cases are analyzed in a comprehensive manner. Some of the cases have now been followed up for two years and remain well, while no untoward effects have ensued. Both rectal and vesical cases are included in the series. In untreated cases the ova readily hatch out on adding $\frac{1}{10}$ c.c. of the deposit from the urine in a conical glass to 6 c.c. warm tap-water, and watching under the microscope in a small glass dish; but by the time about 20 gr. of the drug have been injected, the ova have become sterile and do not hatch out, and by this time the urine is usually clear. The injections should be continued up to a total of about 25 gr. Sterile ova may continue to work through the bladder wall and appear in small numbers in the urine for a long time after all symptoms have subsided and the patients feel quite well. A. Innes¹¹ agrees with Christopherson that tartar emetic is a specific cure for bilharzial disease, and records three successful cases.

N. H. Fairley¹² deals with recent advances in our knowledge of the disease, and records experimental work on monkeys, and a complement-fixation test of diagnostic value based on the toxic nature of the disease. He makes his antigen by macerating infected livers in absolute alcohol. He obtained positive results in 89 per cent of bilharziasis of under two years' duration, and in 74 per cent of more chronic cases, while 150 controls gave uniformly negative results. He thinks the test may be of use in diagnosing early cases and in estimating the effects of treatment. The same writer¹³ records a careful clinical description, laying stress on the initial toxic symptoms before the ova appear in the urine, with afternoon temperature for three to five weeks, cedema, urticaria, pains in the upper abdomen, paroxysmal cough, and eosinophilia. F. E. Taylor¹⁴ summarizes recent work, and confirms the value of tartar emetic.

REFERENCES.—¹*Parasitology*, 1918, Nov. 20, 83; ²*Lancet*, 1918, ii, 325; ³*Brit. Med. Jour.* 1918, ii, 625; ⁴*Ibid.* 716; ⁵*Jour. Trop. Med. and Hyg.* 1919, April 1, 53; ⁶*Ibid.* June 16, 113; ⁷*Ibid.* May 15, 93; ⁸*Lancet*, 1919, i, 1021; ⁹*Brit. Med. Jour.* 1919, i, 480; ¹⁰*Jour. Trop. Med. and Hyg.* 1919, July 15, 129; ¹¹*Brit. Med. Jour.* 1919, ii, 340; ¹²*Lancet*, 1919, i, 1016; ¹³*Quart. Jour. Med.* 1919, July, 391; ¹⁴*Lancet*, 1919, ii, 246.

F. J. Charteris, M.D.

Fairley¹ gives an interesting paper on recent advances in our knowledge of bilharziasis. Japanese investigators have done much to elucidate the life

history of *Bilharzia japonica*. It was known that domestic animals became infected if bathed in certain reputedly dangerous streams. Thus mice, three days after infection, show the parasites in the portal vein. A Japanese investigator found ova in his stools after placing his legs in infected water. A fresh-water mollusc was described as the intermediate host, and Leiper and Atkinson in 1914 worked out the life history of the parasite in the fresh-water mollusc now known as *Katayema nosophora*. Subsequently, to prevent infection of troops in the Nile, where 61 per cent of the fellaheen suffer from bilharziasis, a Commission was sent out to Egypt with Leiper at its head, and soon discovered two different genera of snails in which were found the characteristic non-eyed bifid-tailed cercariæ (larval form of bilharzia). The Commission satisfied themselves that two varieties of bilharzia occur. *B. hæmatobia* has a terminal-spined ovum and develops in a sinistral and spirillated fresh-water snail (*Bullinus*, sp. *contortus* and *drybowski*). The other form is *B. mansoni*, with a lateral-spined ovum, and develops in a flat fresh-water snail, *Planorbis boissyi*.

LIFE HISTORY OF PARASITE.—The ova shed in urine or fæces on contact with water rupture, freeing the active ciliated miracidium. This ciliated embryo, attracted by chemotactic influence, swims for about twenty-four to thirty hours in search of its intermediate host. It enters the snail by piercing the pulmonary chamber, and makes its way to the digestion gland. Here it develops, forming sporocysts (mother and daughter cysts), from which cercariæ are developed by lateral budding. In from four to six weeks the fully-developed sporocysts rupture, freeing the ripe cercariæ, which make their way through the body of the host, escaping into water, in which they survive for thirty-six to forty-eight hours only, perishing then if they do not meet their definitive host. On entering this host, the cercariæ cast their tails, bore their way through the skin, partly by suckers, partly by chemical ferment, thus causing great skin irritation. Eventually the larvæ reach the portal circulation via the veins and possibly also the lymphatics, and then develop in a few weeks into adults of two sexes.

CLINICAL FEATURES.—Both varieties of bilharzia cause generalized symptoms a few weeks after infection. We find: (1) A toxæmic state from four to ten weeks after infection; (2) A localized disease occurring much later—in the case of *B. hæmatobia* localized in the bladder, in that of *B. mansoni* in the intestine.

1. The generalized toxæmic symptoms consist of abdominal pain, fever, bronchitis, diarrhœa, urticaria, with enlargement and tenderness of spleen and liver, and eosinophilia. The onset is gradual, and the symptoms last several weeks, with marked emaciation. The urticaria is an important symptom. It is of an intense type, causing general œdema of the face, and often of penis and scrotum, with wheals on trunk and limbs. It is sudden in appearance, remarkably transient, but lasts on and off for ten days. It may occur alone or associated with temporary or prolonged pyrexia. After the toxæmic stage disappears, anything from six weeks to two and a half years may elapse before the localized bilharziasis manifests itself, though ova are being passed in the dejecta all this time.

2. Vesical bilharziasis commences usually with burning, scalding urethral pain, or deeper-seated perineal pain, terminating in hæmaturia. The hæmaturia may be constant or intermittent, and ova are found in the urine along with pus and red blood-cells. Frequency of micturition is a common early feature, and there may be urgent desire to pass urine. The stools often contain ova, and may show blood and mucus. Rectal examination may show painful tenderness of the prostate and neighbourhood of the vesiculæ seminales. There

is moderate leucocytosis, with relative increase of eosinophils. Ascending involvement of the urinary tract is not common in Europeans, but is frequently seen in fellahen, in whom the mortality is 10 per cent. Intestinal bilharziasis is less markedly severe. Intestinal symptoms are generally slight, with rectal uneasiness, occasional attacks of diarrhoea with blood and mucus, but rarely tenesmus is experienced. In Egyptians, the later stages of the disease are shown in formation of pedunculated submucous tumours, which by sloughing may give rise to extensive intestinal ulceration. Subperitoneal infiltrations also form in the colon.

The habitat of the adult worm explains the different clinical types of *mansoni* and *hæmatobia*. In *B. mansoni* the adult worms inhabit the inferior and superior mesenteric veins and the portal system of the liver, whereas with *B. hæmatobia* these veins are less involved, the main involvement being of the pelvic plexus of veins, the vesical and the uterine.

The female, when laying eggs, leaves the male and goes against the stream till her body blocks the lumen; then she deposits her eggs in suitable venules. When the female withdraws, the blood-current forces the spine into the vessel wall, and in this way the ovum escapes into the perivascular tissue, where it progresses further by an ulcerative process. The *B. mansoni* lays far fewer eggs than *B. hæmatobia*.

The main distributing factor is toxin production from the worm and probably also ova.

REFERENCE.—¹*Lancet*, 1919, i, 1016.

BLACKWATER FEVER.

Sir Leonard Rogers, M.D., F.R.S.

Recent experience in the war areas has completely confirmed the now very generally accepted view that this is but a complication of malaria. L. G. Parsons and J. G. Forbes¹ deal with the trouble in Macedonia, where they met with numerous transient cases in malarious subjects, which they consider it is important to recognize in order to prevent more serious later attacks. The hæmoglobinuria may only last for about twenty-four hours, with nausea or vomiting, shivering, pain or heaviness in the loin, and slight fever, followed by the passage of numerous casts in the urine. Exposure to cold often excites an attack, the cases increasing from October to February. They consider it due to a special toxin in the blood, although they could not demonstrate it, while it is secondary to malarial infection. Warmth, Milk Diet, and, if urine is deficient, Rectal Saline are indicated, while Quinine is only given if malarial parasites are found or definite malarial symptoms present. The patients should be removed from the malarious district. C. D. de Langen² reports on nine cases of blackwater fever, and is convinced that the influence of quinine in exciting it is exaggerated. In a severe case the intramuscular injection of 15 c.c. of Blood Serum was twice followed by immediate improvement in the symptoms, and recovery. A. Patrick³ records a case in which intravenous injection of 1500 c.c. of 1 per cent Saline overcame dangerous anuria and saved the life of the patient. F. Roux⁴ advocates the intravenous injection of Colloidal Arsenic and Iron, and states that he only lost 1 case of 23, and that was a child in whom the intravenous injection could not be given.

REFERENCES.—¹*Lancet*, 1918, ii, 317; ²*Jour. Amer. Med. Assoc.* 1919, i, 767; ³*Brit. Med. Jour.* 1918, ii, 404; ⁴*Presse Méd.* 1918, July 25, 390.

BLADDER, DISEASES OF.

J. W. Thomson Walker, M.B., F.R.C.S.

Traumatic Rupture of Bladder.—According to Fay,¹ the symptoms may be divided into two groups: (1) Those of the first twenty-four hours, i.e., those arising from the bladder itself; (2) Those developing after the first day, i.e., symptoms of peritonitis. In most cases, after the subsidence of shock, a

tentative diagnosis is possible; and where there is strangury, especially combined with abdominal rigidity, and pain and tenderness over the lower abdomen, active interference is imperative. The differentiation of extraperitoneal and intraperitoneal ruptures of the bladder is usually uncertain and often impossible. A dull area over the symphysis, or spreading wing-shaped outward and upward, denotes an extraperitoneal rupture. Free fluid in the abdominal cavity, disclosed by percussion and vaginal or rectal examination, signifies an intraperitoneal rent. If very large quantities of urine are withdrawn by the catheter, the tear is probably intraperitoneal; a normal quantity indicates an extraperitoneal rupture.

The prognosis depends on early operation. When a definite diagnosis of intraperitoneal injury has been made, laparotomy should be performed, free fluid, blood, and exudate removed, and the viscus inspected. The rupture is closed in two layers, and the peritoneal cavity closed. The extraperitoneal rupture is sutured in two layers; and when this is impossible, the wound is packed and drained. Rest for the bladder is ensured by a retention catheter, which the author states may be removed on the third day, and the patient thereafter catheterized at two-hour intervals if he is unable to micturate. The patient is placed in the Fowler position, and continuous proctoclysis is instituted.

Incontinence of Urine.—Universal conscription has revealed, in this and other countries, many cases of adult enuresis, the high proportion of which was previously unsuspected. These cases, hidden in peace time in the privacy of family life, were discovered when the conscript was called for military service. Such cases, together with those developing under the conditions of hardship and exposure incidental to field service, and a considerable proportion of malingerers, form a mass of material for the study of functional disorders of the bladder. The subject is discussed in a number of articles.

Golensky² states that in the Dresden garrison the monthly number of soldiers treated for enuresis and weakness of the bladder varied between 10 and 20 in 1916. In January, 1917, there was a great increase, which reached its height in March (85), and then gradually declined, though the number still remained abnormally high. This sudden increase was apparently connected with the extremely severe cold, another factor being the increase in fluid diet which took place in the beginning of 1917. Increase in enuresis also occurred at the same time in an exaggerated form among children in Dresden. The x-ray examination of 49 patients showed deformity of the sacrum in 25 (51 per cent). The patients were almost entirely from the lower grades of society, and a large number had an anxious, unsteady, and often stupid expression. A large proportion showed signs of degeneration. Examination of the urine was almost always negative. Galensky classified the patients in three groups: (1) Congenital cases (40 per cent); (2) Acquired cases in which the condition had arisen on military service as a result of cold or from shell shock; (3) Simulators, on whom the presence of other bed-wetters had acted by suggestion. Absolute simulation could never be proved, but a large number of patients tried to exaggerate these symptoms. In acquired enuresis, Galensky's treatment was always successful, but in the congenital cases improvement was the most that could be expected. All cases should be treated in special departments. They are put in separate rooms, awakened to pass urine every two hours during the night, restricted as to their fluid intake, especially at night, and given **Hot Sitz Baths, Hot Injections, Hexamine internally, and Electrical Treatment.** Following this treatment, the majority could be discharged in from eight to fourteen days as fit for service. Knock's method of treatment is even more drastic. One large electrode is placed over the region of the

bladder, and the other on the sacrum. A weak current is passed, and later the strongest current for three minutes. The perineum and scrotum are then similarly treated. In very obstinate cases an intra-urethral *Electrical Sound* is used. One half of the moderate cases were thus cured, and one third of the severe cases.

Mohr,³ of the Ehrenbreitstein Garrison Hospital, found that of 50 cases, only 3 showed organic disease, viz., vesical catarrh, multiple sclerosis, and tabes. The remaining 47 had a bladder neurosis, which in 29 was enuresis, including 19 congenital cases, and the rest suffered from pollakiuria, or incontinence, or both combined. All the 47 cases were cured, only three or four having relapses, which were quickly cured by further treatment. Enuresis or incontinence was treated by external *Faradization* of the bladder, combined with psychotherapy. Cases of pollakiuria were kept on a dry diet, and made to rise and pass water every hour day and night. To avoid being awakened so frequently, the patients made an effort to hold their water for a longer time every day until they were cured.

Pollak⁴ and Knock⁵ discuss the subject on somewhat similar lines.

Young⁶ describes an operation for the cure of incontinence of urine in cases where both the internal and external sphincters are dilated or impaired as a result of previous operation. He records 2 cases—one in which the incontinence followed perineal urethrotomy, and the second in which it resulted from perineal prostatectomy performed for prostatitis. The operation consists of two stages: (1) A suprapubic attack on the internal sphincter; (2) A perineal attack on the external sphincter and triangular ligament. For details of the operation the original article should be consulted. Young records two cases successfully treated by this method.

Diverticula of the Bladder.—Rathbun⁷ reviews the subject of vesical diverticula, and describes one case fully. He believes that all true diverticula are congenital. Most of the cases, he states, when carefully questioned, will give a history of some bladder irritability dating from infancy, which has been very much aggravated by an attack of acute cystitis. The diagnosis can usually be definitely established by cystoscopy, and the size of the diverticulum can be estimated by passing into it a urethral catheter until it touches the bottom. The size, shape, and position can be more accurately estimated by cystography. The author uses a 25 per cent solution of sodium bromide as recommended by the Mayo Clinic. The methods of surgical attack are: (1) Suprapubic cystotomy, with simple incision of the neck of the diverticulum in one, two, or more places. This is risky, from the danger of perivesical extravasation. (2) A plastic operation within the bladder. The wall between the bladder and the diverticulum is clamped in two places, cut between, and sutured. (3) The radical extirpation of the whole diverticulum by means of intra- and extravascular manipulation, suturing the defect in the bladder wall either from without or within the bladder. Young recently devised a method by which he draws the sac or its mucous membrane into the bladder by applying an electric suction pump to the orifice. The sac is then excised and the defect repaired. Rathbun recommends the operation in two stages in bad cases, first draining the bladder and dilating the orifice of the diverticulum, and later excising the diverticulum.

Hinman⁸ gives a clinical analysis of 21 cases of diverticulum that have come under his observation. The average age was fifty-six; the youngest patient was thirty-seven, and the oldest seventy-seven. Two cases, age 40 and 56 years, occurred in women, and none in children. The diagnosis was definitely made by cystoscopy and cystography. In 17 operations, a single diverticulum was present in 11 cases, two large diverticula in 4 cases, and three and four large

diverticula each in 1 case. In every case of single sacculaton the orifice was located in the neighbourhood of a ureteral opening. In the cases with two diverticula, there was usually one near each ureteral meatus. In all the 15 operated cases, the region of one or other ureteral orifice was involved. The base and posterior walls of the bladder were markedly trabeculated in every case. In no case was the orifice of the diverticulum on the high lateral or anterior walls. There was a remarkable absence of epithelial lining in the diverticula, but this may have resulted from surgical trauma. The muscle of the walls showed no definite layers. Contracture of the vesical neck was found in 13 cases, and a small fibrous or prostatic ring was removed in 4. The prostate was hypertrophied in 2 cases. The symptoms displayed at the onset, course, and termination, duplicated the clinical picture of prostatism. Vesical calculus complicated the diverticula only once.

Distention of the Bladder.—Curtis⁹ has made a study of the effects of untreated distention of the paralyzed bladder. Paralysis of the bladder was produced in 22 male rabbits by cutting the spinal cord. This injury produces a bladder paralysis analogous to that which occurs in soldiers with gunshot injuries of the spine and cord. Besley strongly urged non-catheterization of the bladder in cases of injury to the spinal cord, and asserted that he had never seen cystitis in such cases apart from catheterization. He further stated that he had never found evidence of disturbed renal function as a result of allowing the bladder to become distended and overflow. Curtis's experience in the experimental cord section did not agree with the statements made by Besley. In the 22 male rabbits, extreme distention occurred in 13, with spontaneous rupture in one instance. Nine showed extensive vesical erosion or ulceration. Back-pressure, with ureteral and kidney-pelvis dilatation, was usually present; in 6 cases this caused wide paths of almost complete destruction of kidney tissue. Bacterial invasion of the urinary tract was demonstrable in 10 of the 22 animals operated upon. The author concludes that these experiments upon rabbits indicate that the unrelieved paralyzed bladder is dangerous, firstly through frequent spontaneous infection of the urinary tract, and secondly through back-pressure which distends the ureters and damages the kidney tissue. "It would appear advisable, therefore, to maintain the paralyzed bladder in a state of freedom from residual urine, thus minimizing the danger of kidney involvement".

Vesical and Prostatic Cancer.—Barringer¹⁰ compares the treatment of carcinoma of the bladder by operation with that by Radium. In treatment by radium, the bladder does not require to be opened, as the radium can be placed with more or less accuracy upon the growth, and left there. Barringer has treated 43 cases of carcinoma of the bladder since October, 1915. On a record of 5 cases 'cured' for varying length of time so far as the bladder is concerned, and 3 other cases that will probably be included also, the author bases a claim for the efficiency of radium treatment in carcinoma of the bladder.

Hinman¹¹ reviews the methods for radium treatment of prostatic and vesical cancer. Certain principles have been evolved. It is important to control the dose by proper screening, accurate placement, and limitation of exposure, so that radium burns may not be produced. Close approximation of the radium to the growth gives far better results than radiation from a distance, even when large doses are used. Various methods have been used. The simplest is the ordinary rubber catheter in which the radium is placed in the rectum, urethra, or bladder. The radium capsule may be fairly well directed by a stylet; or, with the bladder empty, the area to be treated may be supposed to come into contact with the catheter and contained radium by simply inserting the instrument.

For cancer of the prostate Barringer plunges long needles through the perineum directly into the prostate, leaving them about twelve hours. Marion uses a large hydrocele trocar in a similar manner, plunging it through the perineum, and guiding the point by a finger in the rectum. The middle obturator is then removed, and the radium capsule with silver wire attached is pushed through the sheath into the prostate, and the cannula withdrawn. The capsule is pulled out by the silver wire. Burrows has devised a special trocar with a slot for these particular perineal radium treatments. Young has utilized the principles of the cystoscopic rongeur, and devised several instruments by means of which the radium tubes may, under direct cystoscopic vision, be placed accurately on the bladder tumour, and then held in position by a mechanical arm attached to the cystoscopic table.

In the treatment of 8 cancerous prostates, Hinman has had rectal burns in 3 patients. In order to protect the rectal wall and to relieve the patient of the effort of remaining for hours in one position, Hinman has devised an instrument consisting of a central rubber rectal tube which is surrounded near the distal end by a rubber bag, which can be distended with collargol through a separate tube. Two small pockets for radium lie on the surface of one aspect of the bag. The bag is inserted collapsed, and the radium pockets are fitted accurately in position by the finger in the rectum. Collargol or some solution impermeable to radium rays is injected into the bag. The distended bag pushes the radium pockets against the prostate or vesical wall, and holds it in place, irrespective of the position of the patient. The rectal tube allows of the escape of intestinal gas.

For intravesical treatment, Hinman has used an instrument consisting of a brass capsule with a screw-cap for holding the radium. This has a square shoulder into which a wire 25 in. long is fastened and threaded into a holder. This sound is inserted into the bladder, and for radiation of the trigone and areas near the vesical neck, is guided by a finger in the rectum, and held in position by a mechanical arm. For tumours at the apex or other portions of the bladder the style is withdrawn through the urethra, leaving the capsule in the bladder and the attached wire guide in the urethra. A catheterizing cystoscope is threaded on the wire into the bladder, and the radium capsule can be guided to any portion of the bladder, and held in position by fixing the cystoscope by a mechanical arm to the table.

For use of **Hexamethylenetetramine** in disinfecting the bladder (*see p. 8*).

REFERENCES.—¹*Interstate Med. Jour.* 1919, Jan., 46; ²*Med. Supp. Rev. Foreign Press*, 1919, Jan., 30; ³*Med. klin. Berlin u. Wien*. 1918, xiv, 831; ⁴*Wien. med. Woch.* 1918, lxxviii, 831; ⁵*Wien. klin. Woch.* 1918, Aug. 1, 582; ⁶*Surg. Gyn. and Obst.* 1919, Jan., 84; ⁷*Ibid.* July, 28; ⁸*Ibid.* Aug., 150; ⁹*Ibid.* July, 24; ¹⁰*Ibid.* 1918, Nov., 434; ¹¹*Jour. Amer. Med. Assoc.* 1919, June 21, 1815.

BLOOD, CHEMISTRY OF.

Oskar C. Gruner, M.D.

Reaction.—Drouel and Plet¹ show that one of the effects of alteration of the degree of alkalinity of the blood is a dysfunction of the mineral constituents, manifesting by various common symptoms. The use of much meat or much fluid, or a sedentary life, tends to acidosis. Shorten² shows that acidosis may manifest by a peculiar type of dyspnoea, and uses the phosphatic content of the blood as indicator. Langdon Brown³ estimates the condition by studying the ammonia output, the hyperpnoea being evidence of serious derangement. Slemmens⁴ appears to rely on the quantity of glucose and cholesterin for his diagnosis of diminished alkaline reaction. Both these substances are increased.

Gases.—Hitchcock finds that the presence of CO is associated with a distinct increase in the large mononuclears, and a tendency to increase of the total red cells⁵.

Glucose.—Cambridge⁶ gives an improved method of estimating the sugar in the blood. It is necessary to boil the test solutions to get rid of dissolved oxygen: 7.5 c.c. of filtrate and 1 c.c. sodium carbonate solution are boiled together in a small conical flask, and 1 c.c. modified Benedict solution is added after a few seconds.

The value of estimating the amount of sugar in the blood after a test meal of 75 grm. is fully discussed by Bailey,⁷ who shows that such a test is only satisfactory when the urine is tested for sugar also. The amount of blood sugar an hour after the meal may be the same in renal diabetes, early diabetes, or in normal subjects. The concentration may be the same after two or even three hours, whether a person has nephritis, or myxoedema, or hypopituitarism, or long-standing diabetes. On the other hand, the detection of increased blood-sugar in samples collected early in the morning is of great value.

Cholesterin.—Posse⁸ considers an increase of cholesterin in the blood to be a defensive measure against a high blood-pressure. S. di Stefano⁹ considers a fall of cholesterin-content in the presence of anæmia, a sign of increased activity of the liver. It is also associated with a tendency to skin eruptions and congestion of mucous membranes. The cholesterin-content is normal in Banti's disease and in pernicious anæmia (Mandlebaum¹⁰).

Non-coagulable Nitrogen.—An increase of this indicates intoxication from the alimentary tract,¹¹ but Hall and Whipple¹² regard it as evidence of faulty elimination.

Urea.—(See under KIDNEY, FUNCTIONAL EFFICIENCY TESTS.)

Creatinin.—Used as a test for degree of nephritis by Myers and Killian.¹³

Bilirubin.—Bauer and Spiegel discuss the bilirubin-content of blood at length,¹⁴ showing that there is a bilirubin threshold whose assessment indicates the functional capacity of the liver. In health the content is surprisingly uniform. The content rises after the administration of cholagogues, and is very marked in passive congestion of the liver, traumatic hæmothorax, biliary obstruction, and cardiac adynamia. It is diminished in chronic renal disease, tuberculosis, and cancerous cachexia.

Indican.—Becher¹⁵ has made a study of the indican in the blood, and finds the amount definitely increased in cases of renal disease. Whereas the residual N in the blood is not a true index to the total which is retained, the indican in the blood is an almost absolute index of retention.

REFERENCES.—¹*Progrès Méd.* 1919, 87; ²*Ind. Jour. Med. Res.* 1918, No. 5, 570; ³*Med. Rev.* 1919, Jan. 1; ⁴*Amer. Jour. Obst.* 1918, May; ⁵*Jour. Amer. Med. Assoc.* 1919, lxxii, 257; ⁶*Lancet*, 1919, i, 939; ⁷*Arch. Int. Med.* 1919, April, 455; ⁸*Arch. Facult. Méd. Montevideo*, 1918, No. 3, 394; ⁹*La Pédiatr.* 1918, xxvi, 1; ¹⁰*Amer. Jour. Med. Sci.* 1919, clvii, 3; ¹¹*Jour. Exper. Med.* xxiii, 717; ¹²*Amer. Jour. Med. Sci.* 1919, clvii, 453; ¹³*Proc. Soc. Exper. Biol. and Med.* 1918, xvi, 41; ¹⁴*Deut. Arch. f. klin. Med.* 1919, April, 17-40; ¹⁵*Ibid.* 8-16.

BLOOD, COAGULATION TIME OF.

Oskar C. Gruner, M.D.

Chio¹ states that the coagulation of blood is limited or prevented through the adjustment of the CO₂ tension both within and without the body, and therefore varies with the season of the year and the amount of fat in the blood. This reaction is a colloidal one, and therefore better conceptions would be obtained if it were determined how much less concentration of HCl is needed to prevent coagulation.

A similar improvement is suggested by Fonio and Schulsinger,² who have devised a coagulovimeter, with which to determine the coagulation valency. This measures the power which a given blood has of overcoming inhibition of coagulation. A number of tubes are put up containing equal amounts of decreasing strengths of magnesium sulphate. An equal amount of the blood

is added to each, and the amount of coagulum found after twenty-four hours is noted.

REFERENCES.—¹*Arch. Farm. Sperim.* 1918, xxv, 175-192; ²*Schweizer Corr.-Bl.* 1917, No. 20; and *Fol. Hæm.* 1919, 9.

BLOOD, CYTOLOGY OF.

Oskar C. Gruner, M.D.

While the progress in our knowledge upon the blood-cells is hardly measurable year by year, the consideration of the literature of the past few years taken collectively furnishes evidence of interest.

I. *Fallacies to which Blood Counts are Liable.*—Schneider and Havens¹ have shown that the peripheral blood is liable to be very different in composition from the splanchnic blood, because so many blood-cells can be kept back in the splanchnic area, especially during digestion. They also consider that the changes produced by exercise are due to the mechanical action of the muscles in forcing leucocytes from the lymph into the blood.

II. *Reports of Blood Findings in the Literature.*—These show no diminution. This is attributable to the belief that a complete case report is of intrinsic vital importance. There is a decided trend towards revising the hitherto accepted figures for the normal blood-cell formula. Tate and McLeod,² in a research on trench fever, find the following average percentages: neutrophils 44.8, small lymphocytes 41.4, large lymphocytes 4.7, hyaline cells 3.7, eosinophils 4, mast cells 0.7, and transitionals 0.4. The total white-cell count averaged 8595. On the other hand, J. B. McDougall³ considers that such lymphocytosis is evidence of disease (perhaps designable as latent trench fever). American observations go to show that the lymphocyte count is 'normally' high in those who live for some time in the tropics (Murphy and Sturm⁴). Exposure of animals to the dry heat of the interior of a paraffin oven is found to be followed by an increase in the circulating lymphocytes. H. D. Taylor⁵ found an increase in the lymphocytes in 25 out of 38 persons who spent their summer vacation in the country. Bokelmann and Nassau⁶ discuss observations by Klieneberger that the lymphocyte count had become 'normally' higher since the war, even 40 per cent being not an infrequent finding. All three authors attribute the change to antityphoid inoculation, and partly to increased carbohydrate diet.

Numerous experiments have been made with a view to ascertaining factors capable of influencing the count. A series of studies of the effect of α rays has been made by H. D. Taylor, Witherbee, Murphy, Thomas, and Nakahara.⁷ An increase of lymphocytes was found, with evidence of amitotic division of the cells in the blood-stream attributable to repair of necrosis brought about by the action of the rays on the lymph-glands and spleen. Sittenfeld⁸ found he could induce lymphocytosis by means of repeated injections of pilocarpine. Downs and Eddy⁹ find that the digestion-leucocytosis has some connection with the influence of secretin upon the bone-marrow. Fujimoto¹⁰ came to a similar conclusion, though his work is amplified by collateral chemical studies. Pittaluga¹¹ and others have sought to connect up blood-formula changes with changes in the endocrine system (*see* DUCTLESS GLANDS).

Those observations which have been made on the blood in different diseases have not been specifically directed to solving immediate hæmatological problems. Krumbhaar¹² studied the blood in cases of gas-poisoning; Rose Bradford, Bashford, and Wilson¹³ studied the changes in acute infective polyneuritis, Jamieson¹⁴ in methæmoglobinæmia, H. D. Taylor¹⁵ in monkeys experimentally receiving poliomyelitis. In these cases, beyond neutrophilia, there is little of note. Deglos¹⁶ found eosinophilia an index of circulating toxins rather than of parasites themselves, and he also found it marked in a case of chronic unsuspected carbon-monoxide poisoning. The commonly accepted relation

between bone-marrow and neutrophil leucocytosis failed to hold good in some cases of pneumonia studied by Samuel and Lambert,¹⁷ the marrow being aplastic when it should have been hyperplastic, and conversely. Morgan¹⁸ studied the neutrophil count in 169 cases of tuberculous meningitis in order to determine the body-resistance to the inflammatory process, comparing the results with those of the tuberculin skin-test. The more intense the latter and the less change there was in the neutrophils, the less resistant was the patient becoming. Watters had worked out a relation in 1913 which would enable some idea of body resistance to be deduced from the white-cell count, and this has been worked out still more carefully by Walker,¹⁹ showing the evident trend of research at the present time.

III. *The Red-cell Count and the Investigation of the Causes of Anæmia.*—Here we find many difficulties in the way of those who trust to numerical estimations; and the evident desire to put the leucocyte on a rational footing is met by the need to reconstruct our conceptions of the blood-count as a whole. It is no longer of service to compare a given finding with the values found for such and such a disease in the text-books, nor does it suffice to study films merely to ascertain if the case is one of 'pernicious anæmia' or not. Hence the direction in which hæmatology is moving is to use the blood examination for the purpose of discovering the functional state of (1) the hæmopoietic system, (2) the endocrine system, (3) the body as a whole. Instead of regarding hæmatology as a specialism for the detection of cryptic diseases of a certain type, it is raised into the rank of a necessary part of the clinician's armamentarium, such that no important medical case can be said to have been studied until the blood formula has been fully worked out, just as it is often unpardonable to omit an α -ray examination or a full study of the nervous and cardiovascular systems. It is necessary, that is, to form an opinion on the state of the blood-formative organs.

The next stage of refinement in the painting of the blood picture consists in distinguishing cardinal from elemental symptoms (Pappenheim²⁰). The cardinal symptoms, in the case of white cells, are leukæmia and leucocytosis; in the case of red cells, anæmia and erythrocytosis. Leucocytosis and anæmia can never signify a special 'disease', not even a hyperchromic anæmia. At the most, the definite disease is arrived at by a consideration of the sum total of several cardinal symptoms. The elemental symptoms are such as the percentage of Hb, the total count, the details in the blood-smear, the presence of parasites, etc. The author quoted did not hesitate to express the seeming anomaly that the detection of malaria parasites, for instance, does not close the elucidation of a case.

It is a much longer step to the next degree of refinement—that of interpreting findings in terms of endogenous and exogenous causes of the derangement of the functional activity of the hæmopoietic organs. Instead of merely painting a copy of a natural object, we now endeavour to paint a picture with a meaning. The various findings are read in terms of inflammatory reactions, myeloid reactions, lymphatic reactions, and, most recently of all, as evidences of internal secretory states (K. Ziegler²¹). These states again may be interpreted as the outcome of certain kinds of stimuli,²² whose nature is discerned by a consideration of changes of form, size, stainability of the red cells, presence of basophil punctation, of normo- and megaloblasts, and the various phenomena noted in the leucocytes. Thus, the following list of stimuli provides a convenient basis of thought and interpretation: (1) Physiological: This includes the stimuli exciting cell-growth, movement, and reproduction. (2) Paraphysiological: Abnormal but not actually morbid stimuli, arising from changes in the ductless-gland system, changes in the connective-tissue cell-life, and changes in the parenchymal cells of the body. (3) Subpathological: Occurring in various

disorders of metabolism. (4) Actually pathological: (a) Toxic stimuli—non-organized, sometimes autogenous, sometimes heterogenous. This group includes the numerous phanerogenetic intoxications (drugs, ptomaines). (b) Toxo-infective—organized, and of passive or aggressive virulence; exerting pyogenic or histiogenic effects. These stimuli are: (i) hæmolytic; (ii) aplastic; (iii) paralytic to cell-function; (iv) colliquative; (v) cytotoxic; (vi) cytoplasmic; (vii) hæmotoxic; etc. The histiogenic cases indicate the action of acid-fast organisms, the diphtheroids, the mycoses, the protozoan infections. (c) Cytoplasmic stimuli—which exert far-reaching effects.

There is already a considerable literature available for filling in the details of such a table in terms of blood-cell changes, and much of the literature of the past can be re-interpreted along these lines. The study of the dead and dying red cells is supplemented by a study of the dead and dying leucocytes.²³ But toxic action can also be assessed by other clinical data (icterus, hæmoglobinuria, serum tests) as well as by the red-cell counts (Packard and Ottenberg²⁴). C. J. Bond estimates leucotoxicity in the patient's serum by exposing healthy leucocytes to the patient's serum and watching the emigration from the clot, the capacity to elaborate iodophil substances, and phagocytic activity.²⁵

IV. *The Elucidation of the Degree of Body Resistance* is perhaps the converse of the preceding method of study. A full discussion of this is given by Walker,¹⁹ who uses a formula based on two factors only: the total white-cell count and the neutrophil percentage. As he says, neither is sufficient by itself, but, when combined, it is possible to arrive at an index of resistance which can be obtained every day, or at least every third day, as a guide to the processes of regeneration going on within the body during the course of treatment. The formula is: $T - (P - 60) = IR$, where T is the total number of thousands of whites per c.mm., and P is the polymorphonuclear percentage. If IR (the index of resistance) is a minus quantity, the body resistance is rising (good); and when it is a + quantity, the body resistance is falling (bad). Instructive results can be obtained by this method, such as the prediction of impending death in cases of pneumonia, the diagnosis of complications in the course of influenza and measles (tonsillitis, arthritis, bronchitis, abscess), because of sudden falls in the resistance. It is evident that here we have a very simple test, the only drawback to which is its improbability of final reliability, besides the fact that it tends to make the practitioner turn aside from the greater refinements in which trust can wisely be placed.

A criticism of the *Arneth system* is furnished by v. Bonsdorff,²⁶ based on very extensive studies of healthy persons. The formula is found to have a most remarkable constancy day after day, which gives an insight into the extreme delicacy of the balance of cell-regulation. This worker has sought to elucidate a law for the neutrophil leucocytes, from which it would become possible—by carefully counting one group of the *Arneth* classification—to predict the numerical values presented by the other varieties of cell. The reviewer of v. Bonsdorff's work (Schilling-Torgau²⁷) has pointed out the value of using such a law for making only a partial count, picking out just one group of neutrophils, and building the diagnosis on this single observation. This is in accordance with that writer's former contention that the complexity of the *Arneth system* can safely be simplified (MEDICAL ANNUAL, 1912, pp. 163-6). The main answer to this contention is that at present we cannot have too much information from routine cases.

An instance of close attention being paid to the *minutiae* of the differential count is afforded by a short paper by Knyvett Gordon,²⁸ who directs attention to the presence of the lymphoidocyte in the circulating blood. He has found this parent or primordial cell in the blood of several cases of subacute bacterial

endocarditis of the Libman type, but not in influenzal pneumonias, or in three cases of aortic disease. This paper illustrates the tendency to lay essential stress upon the character of individual cells in a blood-smear over and above the factors provided by an ordinary blood-count.²²

V. *Application of Isolated Morphological Facts to Special Diagnosis.*—This aspect of the question will gradually merge into the greater problem of the exact meaning of minute changes in the blood. Oehme²⁹ speaks of the great interdependence between the sympathetic nervous system and the composition of the blood (see also DUCTLESS GLANDS). The corollary from this is the use of adrenalin injections for the purpose of testing the adequacy of the spleen (see SPLEEN). Sauer³⁰ draws attention to the lymphocytosis met with in cases of sympathetic nervous disease, though Huhle³¹ denies this. No doubt the clinical specialist may be misled by habitually seeing only one class of case, and yet the reviewer can corroborate Sauer's finding, aside from the obvious fact that there are many other causes of persistent lymphocytosis.

VI. *Findings in Special 'Blood' Diseases.*—These are referred to under the appropriate headings.

REFERENCES.—¹*Amer. Jour. Physiol.* 1915, xxxvi, No. 3; ²*Quart. Jour. Med.* 1919, xii, No. 45, 1-13; ³*Ibid.* 317; ⁴*Jour. Exper. Med.* 1919, xxix, 1-15; ⁵*Ibid.* 41-52; ⁶*Berl. klin. Woch.* 1918, No. 15; ⁷*Jour. Exper. Med.* 1919, xxix, 53-87 (three articles in succession); ⁸*Jour. Med. Res.* 1918, xxxviii, 465; ⁹*Amer. Jour. Physiol.* 1919, xlvii, 399-403; ¹⁰*Ibid.* 342-350; ¹¹*Arch. Espan. de Ped.*, Madrid, 1918, ii, 513; ¹²*Jour. Amer. Med. Assoc.* 1919, lxxii, 39-41; ¹³*Quart. Jour. Med.* 1919, xii, 88-126; ¹⁴*Ibid.* 81-87; ¹⁵*Jour. Exper. Med.* 1919, xxix, 97-114; ¹⁶*Jour. Amer. Med. Assoc.* 1919, July 19, 231; ¹⁷*Jour. Inf. Dis.* 1918, xxiii, 443; ¹⁸*Amer. Jour. Dis. Child.* 1916, xi, 224; ¹⁹*Jour. Amer. Med. Assoc.* 1919, i, 1453; ²⁰*Grundriss d. hämatol. Diagnostik, etc.*, Leipzig, 1916; ²¹*Fol. Hæm.* xvi, 263; ²²*Pract.* 1919, Oct.; ²³*Exact Diagnosis of Latent Cancer*, H. K. Lewis & Co. Ltd., London, 1919; ²⁴*Jour. Amer. Med. Assoc.* 1917, lxxviii, 954; ²⁵*Brit. Med. Jour.* 1919, i, 729; ²⁶*Fol. Hæm.* xv, 34; ²⁷*Ibid.* 33; ²⁸*Lancet*, 1919, ii, 108; ²⁹*Deut. Arch. f. klin. Med.* cxxii, H. 2, 3; ³⁰*Deut. Zeit. f. Nervenheilk.* 1913, Bd. xlix; ³¹*Deut. Arch. f. klin. Med.* cxlii, H. 5, 6.

BLOOD-TRANSFUSION TESTS. (See also BLOOD TRANSFUSION p. 4).

Oskar C. Gruner, M.D.

Shawan¹ and Moss² simplify the method of blood-grouping by finding that the important point to ascertain is the effect of the patient's plasma on the cells to be introduced. This reduces the number of tubes which need be put up for any given test. All that matters is whether the donor's blood belongs to Group IV or not.

Ashby³ worked out the length of time which the donor's blood remains in the circulation. The transfused corpuscle lives thirty or more days, a conclusion which suggests that the value of the transfusion lies in the introduction of good red cells rather than in stimulating the patient's hæmopoiesis.

Coca⁴ uses a microscopic method of establishing whether a donor is suitable, employing a white-cell pipette wetted with citrate, and drawing up blood to the 1 mark to make a 1-10 solution. The mixed samples are studied on a slide microscopically.

Lee's method is favourably referred to by Hopkins.⁵ The apparatus consists of a glass slide, a needle, and a vial each of Group II and Group III serum to which a little citrate and phenol have been added. A small drop of blood from a finger-prick is mixed with each of the sera on the slide, and the reading made with the naked eye in two or three minutes.

It is shown that the testing of the blood in this way should be carried out before using a given donor for skin-grafts. A graft will not take if the donor's red cells are agglutinated by the patient's serum (Shawan¹).

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1919, clvii, 503; ²*Jour. Amer. Med. Assoc.* 1917, lxxviii, 1905; ³*Jour. Exper. Med.* 1919, xxix, 267; ⁴*Jour. Immunol.* 1918, iii, 93; ⁵*N.Y. Med. Jour.* 1919, July 12, 49.

BOILS.*E. Graham Little, M.D., F.R.C.P.*

Soresi¹ has invented a pretty technique for the introduction of pure **Phenol** into the centre of a boil, which in its initial stage is constituted by suppuration of a pilo-sebaceous follicle, and the treatment is adapted only for initial stages. A needle of smallest bore is attached to a Luer syringe. A few drops of phenol are sucked up into the syringe, and the smooth sliding of the piston is tried before using. When a drop of phenol is seen to be oozing from the orifice, the needle is introduced with the gentlest pressure into the centre of the swelling, usually easily identified by the presence of a hair or a small bead of pus.

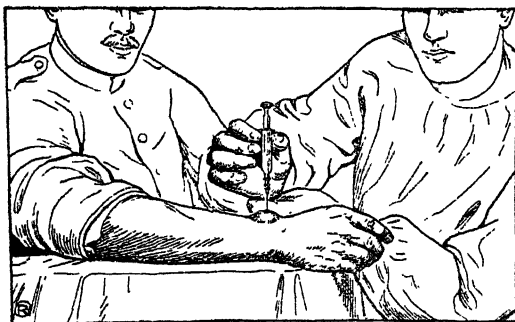


Fig. 2.—Soresi's method of treating boils with phenol.

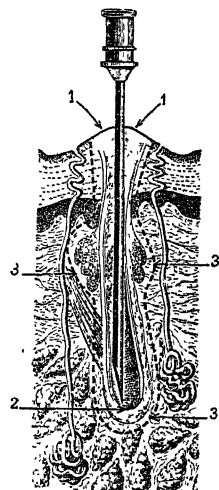


Fig. 3.—Soresi's method of treating boils. (1) Slight swelling indicating the coming boil, centred by hair follicle (the hair removed); (2) Base of follicle into which the phenol should be introduced; (3) Imaginary line of limitation of infection in initial stage.

The piston is allowed to descend by its own weight, and a drop or two is sufficient (Figs. 2, 3). The area is covered with gauze and the patient told to rest. The affected part is to be rendered as immobile as possible. If any acid by accident falls on the skin, its action can at once be neutralized by wiping over with alcohol.

Kritzler² recommends painting the boil in its early stages with **Collodium Acidi Salicylici**. The treatment is especially suitable for the boils on the neck ascribed to friction from a collar.

REFERENCES.—¹*Presse Méd.* 1919, March 24, 154; ²*Pract.* 1918, Nov., 296.

BONE GRAFTS. (See UNUNITED FRACTURES.)**BOTULISM.***Herbert French, M.D., F.R.C.P.*

Botulism is a particular form of food poisoning, and not long since it attained a considerable degree of interest in this country from the fact that patients scattered about the country, and subsequently recognized as being instances of encephalitis lethargica, were at first thought to be instances of botulism. No true cases of botulism were amongst these, however, and interest in botulism itself has therefore declined; but in view of the numerous epidemics of true botulism that have been recorded recently in the United States, and the way in which practically all of the outbreaks have been traced to the consumption of vegetables or fruit preserved at home, either by canning or by bottling, the condition may occur in Great Britain perhaps at any time now that home bottling of fruit and vegetables is being carried out upon such an increasing scale. The possibility of botulism developing from this source, however, or

rather any fear of such possibility, may be allayed when one learns that the outbreaks occurred only amongst people who ate the home-preserved vegetables or fruit without further cooking after the bottles or tins were opened. When the preserved fruit was cooked again before use, it was rendered perfectly harmless.

There are papers on the subject by Dickson,¹ Burke,² Shippen,³ Schlomer,⁴ Bürger,⁵ Perry and Tidy,⁶ and Untoff.⁷ Of all the original articles, those by Dickson and by Shippen are specially worth consulting. The former gives detailed bacteriological experiments and the cultural characteristics of the bacteria recovered from the food and from animals. The latter describes the epidemiology and clinical features of fourteen separate outbreaks. A remarkable feature of some of the epidemics was the way in which chickens, to whom the remains of the canned or bottled products were thrown, went down with botulism and died rapidly of limberneck and symptoms analogous to those of the acute botulism that had occurred amongst human beings who had eaten the same foods.

CLINICAL SYMPTOMS.—The clinical symptoms are partly gastro-intestinal, partly nervous, and the nerve symptoms are the most striking of all. Ocular paralysis, vertigo, weakness or paralysis of the legs, and symptoms of acute bulbar paralysis predominate; death occurring in most cases, apparently from the paralysis of the cardiac and respiratory centres in the medulla.

The following is a typical case: One Sunday Mrs. E. opened a jar of home-canned asparagus and cooked half of the contents; none of the persons who ate the cooked asparagus suffered any ill effects. On the following evening she 'warmed up' the remainder of the asparagus from the jar by placing it for a few minutes in warm, but not boiling, water. Her husband stated that this asparagus did not taste very good, but he ate it all. The next day, in the afternoon, Mr. E. began to complain of disturbance of vision, was nauseated, and vomited. On the Wednesday morning he was very weak; vomited again after taking food, and had severe diarrhoea, the latter continuing throughout the day and following night. During that night the patient complained of severe cramps in the legs. There was no abdominal pain during this time, and no disturbance of sensation. During the Wednesday afternoon he began to have difficulty in talking; on the Thursday he was unable to sit up because of weakness, and he complained that he could not hold up his head. He was unable to speak intelligently, and he complained of dryness in the mouth and pharynx. During the afternoon he began to have difficulty in swallowing, and by the evening "all the water returned through his nose". He had much difficulty in clearing thick tenacious mucus from his pharynx, and had severe strangling spells when he attempted to swallow. There was no fever, no pain (except the cramps in his legs), and he remained mentally quite clear. He was found dead in bed early on the Friday morning about two hours after he had succeeded in swallowing a small amount of milk. Another jar of the same lot of asparagus was opened the same week and was served cold as a salad, of which two persons partook, both developing symptoms precisely similar to the above, and both dying about the fourth day afterwards. Ocular paralysis and severe strangling on attempting to swallow were pronounced. The temperature in neither case rose much, though it has done so in other cases.

Post-mortem examinations showed congestion of the meninges and of the abdominal and thoracic viscera and incipient bronchopneumonia. Typical thrombi both in the lungs and in the meningeal vessels have been discovered microscopically.

The remnants of the cold asparagus salad were thrown out into the chicken run, and all the chickens developed typical symptoms of limberneck and

died. Bacteriological examination of the contents of the crops and gizzards of ten of the chickens was made, and from six of them a virulent strain of *B. botulinus* was isolated. The asparagus was bottled according to the directions published by the Kerr Glass Manufacturing Company, with the exception that it was not parboiled or blanched before it was packed in the jars. The material was purchased in the city market, washed in cold water, packed into one-pint and one-quart Mason jars, and covered with cold water to fill the jars completely. Half a teaspoonful of salt was added to each jar, and the covers were applied loosely. The jars were immersed to the neck in a boiler which had a tightly fitted cover, and were allowed to remain for three hours after the water began to boil. On removal from the boiler the jars were sealed tightly and kept in a dark cupboard, and the whole procedure was carried out with all ordinary housewifely care.

The symptoms in other cases were very similar. Although many cases proved fatal, some recovered after a severe illness. Besides asparagus, cases are recorded from the similar use of apricots, French beans, and other vegetables or fruits preserved at home in a similar way; but in every case only when the vegetables or fruits so preserved had not been cooked again before use.

The effect of heat on the spores of *B. botulinus*, and its bearing on home-bottling methods, has been investigated experimentally by G. S. Burke,³ and her results show conclusively that the re-cooking of home-preserved vegetables entirely removes any liability to botulism.

It is, however, of the greatest importance that we should be aware of the danger of botulism and fatalities from it if home-bottled vegetables and fruit are eaten straight from the bottles without re-cooking before use.

REFERENCES.—¹*Brit. Med. Jour.* 1918, ii, 693; ²*Jour. Amer. Med. Assoc.* 1919, i, 88; ³*Arch. Intern. Med.* 1919, March, 346; ⁴*Med. Supp. Rev. Foreign Press*, 1918, Aug., 251; ⁵*Ibid.* Dec., 453; ⁶*Lancet*, 1919, i, 348; ⁷*Berl. klin. Woch.* 1918, lv, 872; ⁸*Jour. Amer. Med. Assoc.* 1919, i, 88.

BRONCHIECTASIS.

Arthur Latham, M.D., F.R.C.P.

Mayer¹ gives a preliminary report on the treatment of bronchiectasis by **Washing out the Affected Bronchi**. He uses a double tube, which is introduced through the bronchoscope into the affected bronchus. An irrigator is attached to one of the tubes and a suction apparatus to the other. Then saline solution, and later an antiseptic solution, are passed through the diseased area. The sputum is said to lose its offensive odour and become less in quantity.

REFERENCE.—¹*N.Y. Med. Jour.* 1918, cviii, 666.

BRONCHOSCOPY.

P. Watson-Williams, M.D.

A. J. Wright, M.B., F.R.C.S.

Chevalier Jackson,¹ with his probably unrivalled experience of 628 cases of foreign bodies in the trachea or bronchi, has had a successful result in 98.1 per cent of cases, with a mortality of less than $\frac{1}{2}$ per cent directly attributable to the operation. As regards the type of foreign body, he found that considerable differences are produced both as to the corrosion or other change in the foreign body and as to the tissue reaction. Of metals, iron and steel are corroded rapidly, and the resulting increase in bulk may increase the stenosis, whereas brass, gold, and lead corrode but slowly; wood, rubber, bone, and glass all remain unchanged. The most intense tissue reaction is produced by vegetable substances, this reaction having been observed to the most extreme degree in the case of pea-nut kernels, which produce a diffuse tracheobronchitis in a few hours. The reaction produced by hard foreign bodies is localized, and depends in degree on whether they cork the bronchus, and also whether

they are rough or smooth. Tissue reaction is much more intense in children than in adults.

In all cases of prolonged sojourn of a foreign body in the air-passages the clinical signs and symptoms of pulmonary sepsis supervene. The prominent pathological features are profuse foul secretion with mixed bacterial features but absence of the tubercle bacillus, the presence of a stricture of the bronchus with the foreign body imbedded in it, and below, a cavity formed either by a dilated bronchus or an abscess in the lung. After removal of the foreign body the recovery of the lung is very complete, even in the long-standing cases; complete recovery with disappearance of abnormal signs in the lungs took place in one case after the removal of a glass collar-stud which had been in the bronchus for twenty-six years.

The *asthmatoïd wheeze* is the term used by Jackson² in describing a new diagnostic sign of foreign body in trachea or bronchus. It is a sound heard by placing the ear in front of the patient's mouth during expiration, and resembles the wheezing of an asthmatic; but is dried and is often more marked after the coughing up of secretion. It is caused by the vibration of air passing over the foreign body, and therefore is not present when the bronchus is entirely occluded. It is of great value when the body is not opaque to *x* rays, and was found to be present in 41 of 62 cases in which it was searched for.

Chamberlin³ advocates suspension laryngoscopy for the removal of foreign bodies lying in the larynx, hypopharynx, or upper end of the œsophagus; a tube is difficult to keep in place, the tip only being engaged.

REFERENCES.—¹*Surg. Gyn. and Obst.* 1919, March, 201; ²*Amer. Jour. Med. Sci.* 1918, Nov., 625; ³*Laryngoscope*, 1918, Oct., 744.

BURNS. For the employment of **Magnesium Sulphate** (*p.* 9).

CANCER, DIAGNOSIS OF.

Oskar C. Gruner, M.D.

1. *From Direct Histological Examination of a Test Puncture.*—H. T. Deelman¹ settles the nature of accessible growths by puncture with a hollow needle, working the tip about so as to scrape off cell-fragments, and aspirating them into the needle. The fragments are fixed in formalin, dehydrated in acetone, and examined microscopically. He states that surprisingly useful results are obtainable by this means.

2. *From Chemical Study of the Blood.*—

a. Total non-protein sulphur: Kahn² finds this increased by two or three times, while the total sulphates remain unaltered.

b. Total N and soluble N: Robin³ finds that these are increased.

c. Sugar tolerance: Rohdenburg, Bernhard, and Krehbiel⁴ believe that in malignant disease there is a derangement of endocrine function which might be revealed by this form of study. 100 grm. glucose is given in tea or coffee, and the blood is collected before the dose, forty-five minutes after, and two hours after. In cases of cancer the amount of glucose steadily rises, whereas in health it falls after three-quarters of an hour. The test is based on 25 positive results for malignant disease, as against 40 negative results in non-malignant cases. It bears no relation to the site of the tumour. De Niord and Schreiner,⁵ however, in an extensive study, conclude that the blood-sugar is not characteristically changed in cancer. They also tested the diastase-content of the blood, and find that this also reflects merely the diet and exercise. Their work concerns 29 cases of cancer, 61 of miscellaneous conditions, and 5 of syphilis, but it does not appear whether they adopted an endurance test.

d. Amylase: Loeper⁶ found more amylase in cases of cancer of the pancreas.

3. *From Morphological Changes in the Blood.*—Changes of this kind have been

admitted almost uniformly in cases where the bones themselves are involved. Roznowski⁷ finds that sometimes there are no changes in such cases, whilst others present numerous nucleated reds and myelocytes. Sometimes there is leucopenia, sometimes there is a high leucocytosis.

S. Carro⁸ uses the differential count only for determining the intensity of the morbid process in cases of gastric cancer. Waledinski⁹ simply uses the neutrophil count, drawing attention to the relative neutrophilia, which he ascribes to septic infection of the tumour. A much greater refinement of study of the morphological changes¹⁰ is attained when the minute nuclear and intracellular characters of blood-cells are noted. Some of these features, and the frequency with which they are met per 100 cases, are as follows: Viscidity of the blood, 87; dense agglutination of corpuscles, 81; absence of rouleaux-formation, 90; richness in suspended matter, 52; leucocytosis, 51; active and bizarre amœboid forms, 52; ex-nuclear pseudopods, 44; pyriform pseudopods, 56; richness of azur granules in the mononuclear cells, 35; spiral bodies in the hyalines and large mononuclears, 90; great variability in form of platelets, 70.

4. *Serum Tests*.—Farmachidis¹¹ has revised his cobra-venom (deviation of complement) test.

5. *From the Gastric Contents*.—Loeper¹² states that if the washings contain no leucocytes or other cellular elements, gastric cancer is not present. Tumour cells are more resistant to manipulation and to digestion. Their nucleus is richer in chromatin and often plurilobed.

6. *From the Urine*.—Kahn² finds the ratio of neutral sulphur to oxydized sulphur is increased, while the total sulphur is diminished.

7. *From the Fæces*.—Gregersen¹³ finds that if the fæces contain no blood for a few successive days, the case cannot be one of either intestinal or gastric cancer. The test is described under FÆCES, CLINICAL PATHOLOGY OF.

REFERENCES.—¹*Nederlandsch. Tijdschrift voor Geneeskunde*, 1918, ii, 744; ²*Proc. Soc. Exp. Biol. Med.* 1919, xvi, 139; ³*Progrès Méd.* 1919, 260; ⁴*Jour. Amer. Med. Assoc.* 1919, i, 1528; ⁵*Arch. Int. Med.* 1919, 484; ⁶*Progrès Méd.* 1919, 151; ⁷*Zeit. f. klin. Med.* lxxx, H. 5, 6; ⁸*Siglo Med.*, Madrid, 1918, lxxv, 633; ⁹*Russky Wratsch*, 1913, 44; ¹⁰*Exact Diagnosis of Latent Cancer*, H. K. Lewis & Co. Ltd., 1919; ¹¹*Rif. Med.* 1918, xxxiv, 382; ¹²*Progrès Méd.* 1919, 171; ¹³*Ugeskrift f. Laeger*, 1918, lxxx, 691, 733.

CATARACT.

R. Foster Moore, F.R.C.S.

The ideal operation for cataract is a simple extraction, leaving the iris entirely intact; but to this method there is one real objection—that prolapse of the iris after operation is of somewhat common occurrence. Some authors do not admit more than 5 per cent, but others a much greater frequency. There is no doubt that the percentage of prolapse can be reduced by cutting out in the cornea, but this sacrifices the great advantage of a flap of conjunctiva to cover the incision. There can be no question that if the incision is made sufficiently far back to include a flap of conjunctiva, prolapse of the iris will occur in as many as 15 per cent of cases, unless some form of iridectomy or iridotomy is performed. Elschmig,¹ in order to avoid prolapse, makes a 1-mm. snip with scissors at the root of the iris, parallel to the edge of the cornea. Constantinescu² covers the line of the incision with conjunctiva by means of a separate procedure, dissecting it up from the limbus, avoiding all submucous tissue, and pulling it down over the wound from above.

Axenfeld³ advocates a free incision of the external canthus under novocain anæsthesia as a preliminary to extraction in certain cases where the globe is deeply sunken, and in refractory patients.

A procedure, which is in part new, for the removal of lamellar cataract, is described by Mulock Houwer⁴, and is said to be in general use in the Amsterdam Clinic. After incising the anterior capsule, the anterior layers of the

lens are freely broken up; the centre of the lens is then coaxed forward through the pupil into the anterior chamber, where it is left. It is claimed that, seeing that the bulk of the lens is in front of the iris, there is less liability to increase of tension.

Barraquer and Anduyned's⁵ method of extracting a cataract in its capsule appears worthy of further consideration. Their ideal is to remove a cataract in its capsule if escape of vitreous can be avoided in the process, a view from which few would dissent. They state that if the coats of an eye of a cadaver be carefully removed, leaving the lens and vitreous together, one can separate the lens from the fossa patellaris by drawing on it with forceps, breaking the zonule without rupturing the hyaloid. Their method is an attempt to reproduce this procedure in the living subject. A grip on the lens below its centre is obtained by means of a special suction apparatus. The lens is then gently rocked so that its upper edge is advanced slightly. Very little traction is necessary to make the zonule yield, and the lens is withdrawn with the apparatus. A very striking point apparently is "that one does not observe the least indication of violence and does not appreciate the least resistance". The operation is facilitated by full cocaine mydriasis.

Rowe Jeremy⁶ records a case of development of cataract in each eye four months after partial removal of the thyroid gland for malignant disease. The patient looked myxœdematous, was very feeble, and had frequent attacks of tetanic spasms of the legs, which were relieved by thyroid extract.

Schauz⁷ has carried out an interesting experiment having a bearing on the production of diabetic cataract. He prepared a sterile solution of lens albumin from frogs' eyes. Some of this solution was placed into three pairs of flasks, of which one in each case was exposed to sunlight for two days, the other being kept in the dark. To the first pair of flasks dextrose and acetone were added; to the second pair dextrose alone, and the third pair salt solution only. Some remaining solution was divided into two flasks, to one of which acetone alone was added, to the other saline solution; both were exposed to light. On testing the contents with very dilute acetic acid in the tubes exposed to light, a precipitate was always produced by an amount of acid which produced no precipitate in the unexposed flasks. The suggestion is that the presence of sugar and acetone aids the action of light in making the lens opaque in diabetic patients.

REFERENCES.—¹*Arch. f. Augenheilk.* 1911, lxix, pt. 4; ²*Klin. Monatsbl. f. Augenheilk.* 1914, March-April; ³*Ibid.* 1915, liv, 97; ⁴*Ibid.* 1917, Feb.-March; ⁵*La Clin. Ophth.* 1917, June; ⁶*Brit. Jour. Ophth.* 1919, July, 315; ⁷*Arch. f. Ophth.* 1916, xci, pt. 2.

CEREBROSPINAL FEVER.

J. D. Rolleston, M.D.

BACTERIOLOGY.—G. H. Robinson¹ describes a rapid method of determining the type of meningococcus infection, of which, as Gordon has shown, there are four distinct groups (*see MEDICAL ANNUAL*, 1919, p. 99). The patient's spinal fluid is centrifugalized until it is clear; $\frac{1}{2}$ c.c. of this fluid is added to an equal amount of each of the four type sera, and the tubes are thoroughly shaken and warmed to 37° C. in a water-bath. If a positive reaction is obtained, a distinct flocculent precipitate forms in a few minutes.

In 43 cases reported by A. H. Carter and J. T. Boyes², in which the type of meningococcus was identified, Type II proved the most prevalent (22 cases), and also the most fatal (13 deaths); next came Type I (16 cases), with 4 deaths; 1 case which recovered belonged to Type III; and 4 cases, 2 of which recovered and 2 died, to Type IV.

Embleton and Steven³ found that in 35 out of 36 carriers, or in 97 per cent, the type of meningococcus was the same in the nasopharynx as in the cerebro-

spinal fluid. A convalescent case carried only one type of meningococcus at a time, and was relatively insusceptible to other types of meningococcus.

ETIOLOGY.—In his account of the method of dealing with epidemic meningitis at Camp MacArthur, L. S. Medalla⁴ states that out of a total of 6926 cultures from a total of 2568 individuals, only 56, or 2.25 per cent, were positive. This low percentage was attributed to the fact that most of these individuals were really not close contacts because of the open-air life which obtained in the squadrons. In 24 of the carriers whose records were kept, the average length of time that the meningococcus persisted was seven days. There were no chronic carriers. Practically all the 24 carriers had some treatment while in hospital, either Dakin's solution alone or combined with dichloramine-T, though it was difficult to tell whether treatment was responsible for the disappearance of the organisms.

Embleton and Steven³ found that the duration of carrying in 86 cases, from the onset of the disease or a very early stage of convalescence, was on an average about six months; 49 cases carried less than this time, 37 exceeded it. The longest time that a case was proved to carry was 608 days.

J. D. Aronson and S. A. Friedberg⁵ report a small epidemic in a camp, which was traced to a carrier who had large tonsils and adenoids. Bacteriological examination after removal showed meningococci in the adenoid tissue, but not in the tonsils. Persistently negative cultures were obtained from the nasopharynx after healing of the operation wound.

The comparative immunity of Egypt from the disease is attributed by A. Compton⁶ to the low carrier-rate, which was only 1 per cent among 310 non-contacts taken at random in the Alexandria district.

A. G. Love and C. B. Davenport⁷ found that as a general rule recruits coming from the most thickly-populated areas of the United States were less susceptible to cerebrospinal fever than those from more sparsely settled districts. This immunity of city-bred recruits, which was also exemplified in the cases of measles, mumps, lobar pneumonia, and scarlet fever, is attributed by the writers to life in urban communities producing a general resistance to disease.

The relation of the disease to campaigns is discussed by Sir Humphry Rolleston,⁸ who states that the greater incidence of cerebrospinal fever since the outbreak of war is mainly due to overcrowding in barracks, as it is a disease, not of the open campaign, but of training camps, mobilization centres, and depôts.

SYMPTOMS.—Lüdke⁹ draws attention to the occurrence of *atypical forms* of cerebrospinal fever which are very liable to be mistaken for other infectious diseases; thus, one of his cases was mistaken for fish poisoning and another for gastro-intestinal catarrh, and it was only after seven and ten days respectively that definite meningeal symptoms developed and the diagnosis was confirmed by lumbar puncture. Abortive cases occasionally occur and are not recognized owing to their short course and mild symptoms. Severe psychical symptoms, especially hallucinations, may sometimes usher in the disease.

A. Netter¹⁰ states that *relapses* occurring more than a month after recovery are rare; he observed only 4 instances among 380 cases. The date at which they occurred ranged from 33 to 73 days after the first attack. The variety of late relapses is due to active immunity conferred by the first attack, and passive immunity resulting from serum treatment. The appearance of the relapses implies that immunity in such cases has not been conferred, or else that it has disappeared. It also indicates the intervention of virulent meningococci which may have persisted in the meninges or other foci in the course of the disease. In other cases the relapse may be due to a fresh infection. In

two of Netter's cases the relapse was probably caused by measles, which predisposes the patient to secondary infection.

To emphasize the extrameningeal rôle of the meningococcus, Herrick,¹¹ whose articles on meningococcus sepsis were reviewed in last year's MEDICAL ANNUAL, p. 100, reports the following six cases in which meningitis was absent or a subordinate part of the disease: (1) Meningococcus sepsis without meningitis either clinically or at necropsy; (2) Meningococcus sepsis without clinical meningitis but with evidence of early meningitis post mortem; (3) Septic polyarthritis cured by intravenous serum therapy; (4) Meningitis with a premeningitic stage of meningococcus septicaemia of several weeks' duration; (5, 6) Meningococcus empyema of accessory nasal sinuses, both without meningitis.

E. B. Krumbhaar and J. H. Cloud¹² report three cases in soldiers of cerebrospinal meningitis complicated by *endocarditis*, vegetations showing meningococci being found on the aortic and mitral valves post mortem. The early occurrence of petechiae in all three cases, and the isolation of Gram-negative diplococci from the petechiae in one, as in the cases described by Netter (see MEDICAL ANNUAL, 1918, p. 129), indicated an early generalization of the infection.

Herrick¹³ reports 12 cases of meningococcal *pericarditis*, 10 of them fatal, which occurred among 280 cases of cerebrospinal fever, a percentage of 4.29; 6 of the cases were examples of dry pericarditis, and 6 showed an effusion. The symptoms are rarely as characteristic as those of pneumococcal pericarditis, but merge into those of the general disease. As a general rule the complication developed at a late period of the acute stage. As pericarditis occurs in cases in which meningococcus sepsis is present, intravenous serum therapy is the chief method of treatment, and should be combined with local injection of serum into the pericardial sac. In one case with effusion, all the symptoms disappeared after a single local injection of 30 c.c. of antimeningococcal serum.

J. R. Latham¹⁴ has recently seen an unusual number of cases complicated by *epididymitis*, which presented the following characteristics: (1) Slight degree of pain and absence of any constitutional disturbance, in striking contrast with the orchitis of mumps; (2) Absence of any associated orchitis; (3) Comparatively quick return to normal, and absence of any tendency to atrophy.

The following *sequelae* were observed by A. J. Rosanoff¹⁵ among soldiers who had been treated with specific serum both intrathecally and intravenously: limitation of flexion of the spinal column, undue fatigability, pains in the back, legs, and head, tendency to dizziness and faintness, muscular weakness, blurring of vision associated with photophobia, and impairment of sleep combined with a state of under-nutrition. In practically all the cases the condition remained stationary when treated merely by rest, but showed improvement under graded exercises. A. A. Landry and W. H. Hamley¹⁶ also allude to the frequency of various aches and pains, stiffness of the back and legs, etc., classified as 'post-meningitic neuroses', and are inclined to believe that there may be an element of malingering in some.

Instances of *mixed infection*, such as the association of meningococcus meningitis with pneumococcus meningitis, or with staphylococcus and streptococcus otogenic meningitis, have been reported by J. G. Fitzgerald¹⁷ and Jaffé¹⁸ respectively. All the cases were fatal, though in one of Fitzgerald's three cases improvement at first took place after four or five intrathecal injections of antimeningococcus serum.

¹¹ PROPHYLAXIS.—J. A. Glover¹⁹ points out that a high carrier-rate usually denotes overcrowding and dangerously unhygienic conditions, even though no cases of the disease may have recently occurred. While sporadic cases

may occur with any carrier-rate, anything approaching an epidemic of cerebrospinal fever is preceded by a considerable rise in the carrier-rate. Severe overcrowding will probably be accompanied by a carrier-rate of at least 20 per cent, as compared with a carrier-rate of 2 to 5 per cent, which may be considered usual under the best conditions obtainable in barracks and hutments. 'Spacing out' of beds to 2½ ft. distance, thereby reducing the number in each hut from 32 to 23, and simple methods for improving ventilation, are very efficient agents in reducing high carrier-rates. Recruits, who are particularly prone to the disease during the first three months of service, should be specially spaced out.

Owing to the conflicting and inconclusive statistics relating to carriers, and the absence in his experience at a large garrison of any evidence that carriers convey active infection, J. Dorgan²⁰ regards the isolation of carriers as "impracticable, irrational, and unjustifiable", and considers that the early isolation of mild and severe cases, and the provision of free ventilation with sufficient warmth during the time of seasonal prevalence, constitute the most effective means of prevention.

TREATMENT.—W. J. Stone and R. C. P. Truitt²¹ regard early energetic treatment as of the greatest importance, and recommend the following plan: First day, one **Intravenous Injection** of from 60 to 80 c.c. **Serum** and two **Intraspinal Injections** of from 30 to 40 c.c., each after spinal drainage of 45 to 55 c.c. of fluid; second day, same treatment, except that from 80 to 100 c.c. of serum should be given intravenously, and two intraspinal injections; third and fourth days, repeat, if necessary; fifth to eighth day, one spinal injection; ninth and tenth days, one spinal drainage daily. Before giving the first intravenous injection it is wise to desensitize by a subcutaneous injection of 1 c.c. of serum. The intravenous injection should be given slowly, at the rate of 1 c.c. of warmed serum per minute, for the first 10 or 15 c.c. If anaphylaxis occurs, the injection should be stopped. **Epinephrin Chloride**, 1 c.c. of the 1-1000 solution hypodermically, relieves symptoms of anaphylaxis. **Atropine**, gr. $\frac{1}{100}$, is also useful.

The value of serum treatment is illustrated by the following figures from Sir Humphry Rolleston's²² report on cerebrospinal fever in the Royal Navy. Out of 502 cases during the four years of the war, 96 did not receive any serum, and of these, 49 (or 51 per cent) proved fatal; whereas among 92 cases during 1917-18, 81 were treated with some brand of serum, with a mortality of 27 (or 29 per cent), as compared with a mortality of 95 (or 32.7 per cent) among 295 cases treated during the last three years of the war. During the first year of the war, when the serum proved to be inert, the mortality of cases treated with it was 61 per cent. During the second, third, and fourth years of the war, 214 received Flexner's serum alone or in combination with other serums, and of these, 65 (or 30 per cent) proved fatal.

De Witt Stetten and Dudley Roberts²³ report a case of acute obstructive hydrocephalus due to cerebrospinal fever in a soldier, age 19, successfully treated by **Puncture of the Corpus Callosum and Ventricular Drainage**. When seen six months after the operation, his mental and physical condition was in no way impaired.

REFERENCES.—¹N.Y. Med. Jour. 1919, i, 464; ²Lancet, 1919, i, 1065; ³Ibid. 788; ⁴Boston Med. and Surg. Jour. 1918, ii, 787; ⁵Med. Rec. 1918, ii, 1017; ⁶Lancet, 1919, i, 157; ⁷Arch. Internal Med. 1919, ii, 129; ⁸Lancet, 1919, i, 541; ⁹Med. Supplement Rev. Foreign Press, 1919, 127; ¹⁰Arch. de Méd. des Enf. 1919, 73; ¹¹Arch. Internal Med. 1919, i, 409; ¹²Jour. Amer. Med. Assoc., 1918, ii, 2144; ¹³Surg. Gyn. and Obst. 1919, i, 385; ¹⁴Jour. Amer. Med. Assoc. 1919, i, 175; ¹⁵Ibid. 1918, ii, 1476; ¹⁶Amer. Jour. Med. Sci. 1919, i, 210; ¹⁷Jour. Amer. Med. Assoc. 1918, ii, 969; ¹⁸Med. Supplement Rev. Foreign Press, 1919, 127; ¹⁹Brit. Med. Jour. 1918, ii, 509; ²⁰Lancet, 1919, ii, 97; ²¹Arch. Internal Med. 1919, i, 232; ²²Jour. Roy. Naval Med. Serv. 1919, 131; ²³Jour. Amer. Med. Assoc. 1919, i, 244.

CHEST, SURGERY OF. (See EMPYEMA.)

CHILBLAINS.

E. Graham Little, M.D., F.R.C.P.

Levin¹ tried Ultra-violet Light with success in three cases of chilblain, from one to three ten-minute exposures to the quartz mercury-vapour lamp being used, with the quartz filter at a distance of 10 inches from the skin. If the exposure has to be repeated, a week's interval should be observed.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, March 22, 855.

CHOLERA.

Sir Leonard Rogers, M.D., F.R.S.

ETIOLOGY.—E. D. W. Greig¹ publishes a useful summary of his bacteriological investigations of cholera in India, which have been dealt with in earlier issues of the MEDICAL ANNUAL, including the differentiation of certain cholera-like vibrios. C. S. Panganiban and O. Schobl² advise, for the preservation of cholera stools for bacteriological examinations, 50 per cent ox bile in water, while 1 per cent sodium chloride is also useful; but glycerin failed.

PROPHYLAXIS.—A. Roy³ has found the cholera Vaccine prepared at Kasauli to be harmless, and efficacious in protecting coolies emigrating to Assam during a severe cholera outbreak.

TREATMENT.—Stumpf⁴ claims a great reduction of the mortality from cholera in Serbia through drinking or administering by the bowel large amounts of suspensions of Kaolin in water. [Kaolin forms the basis of Rogers' permanganate pills, which have been regularly used in India since 1909.—L. R.]

REFERENCES.—¹*Edin. Med. Jour.* 1919, July, 4; ²*Philippine Jour. Sci.* 1918, Sept., 275; ³*Ind. Med. Gaz.* 1919, June, 209; ⁴*Jour. Amer. Med. Assoc.* 1918, ii, 1866.

CHOREA.

Frederick Langmead, M.D., F.R.C.P.

ETIOLOGY.—The relationship between chorea and rheumatism is so well authenticated and so definite that it will take a great deal of evidence to disturb the belief in their common origin. Prof. Hutinel¹ refers to a paper read by Milian, who declared that in fifteen cases under his notice chorea was due to inherited syphilis. Hutinel has found evidence of syphilis in 33 per cent, but does not consider that chorea can be attributed exclusively to infection by the spirochæte. He regards, however, the influence of hereditary syphilis on the supervention and course of chorea as by no means a negligible factor. It is easy to understand that if the development of the brain has been hindered, and its vessels more or less damaged by specific infection, that organ is in a condition of diminished resistance and more liable than another to react to accidental infection. In most cases of serious chorea, together with the incoordinated movements, we meet with functional impotence merging into paralysis. In one such case the Wassermann reaction was positive, and the patient rapidly improved under the influence of intravenous injections of Cyanide of Mercury. In cases of paralytic chorea he regards it as incumbent upon us to look out for signs of syphilis, for antisyphilitic treatment sometimes yields very successful results. In chorea in syphilitic subjects he has also met with cases where maniacal excitement, delirium (of persecution), and anxious depression with suicidal tendencies have persisted after the movements have ceased. In such cases he does not hesitate to apply antisyphilitic remedies, for he believes that the syphilis takes precedence over the rheumatism in grave cases of chorea. P. Marie and Chatelin obtained better results with Intravenous Injections of '606' than with any other remedy. Hutinel prefers '914'. Since these substances contain arsenic in a particularly active form, it may be asserted that their action is not specific. He has seen, however, improvement follow mercurial injections alone. Not all cases are amenable to '914', and still fewer

to mercury, and these remedies are only warranted when there are signs of inherited syphilis and the Wassermann reaction is positive. It is prudent to think of syphilis in all cases of chorea which are unusually severe or unduly protracted, but it would be puerile to imagine it in every instance.

TREATMENT.—M. Grossman² writes in favour of re-education. Even during the acute febrile period he has found the rest or relaxation exercises described by W. J. M. A. Maloney of value. The patient is asked to take a deep breath, using her diaphragm, restricting her thoracic movements, and at the height of inspiration to pause, then slowly and evenly expire, and again pause; this soon tires the patient, so that, after ten or twelve deep inspirations, their depth and the pause are shortened until she is breathing without effort as in sleep.

To relax the muscles, *passive movements* in which they are alternately lengthened and shortened are employed. The muscles of the forehead, cheek, and jaw are thus manipulated until the wrinkling of the forehead and the blinking disappear, and spasm is eliminated. The same procedure is then followed for the shoulders, arms, and legs. During passive movements the operator continually directs the patient's attention to the control of the choreic movements; gradually this requires less and less effort, and soon complete and perfect relaxation is possible.

After the temperature and pulse-rate have been normal for several days, and the child has mastered the rest exercises well enough to allow her limbs to be moved freely in all directions without exciting rigidity or spasm, *active movements* may be begun. At first these should be simple, such as flexion, extension, adduction, and abduction. Rhythm, rate, and force of movement should be regulated by counting or using the metronome. Next, the patient resists the movement, in order to increase his ability to maintain tonic contraction, and finally the movement is done against the resistance of the operator. When there is ability in a recumbent position to perform all the movements in proper time and rate to the normal extent and with normal force, re-education in maintaining the normal attitude may be begun. Creeping on the hands and knees is taught first; next balancing and creeping on the knees alone are attempted, and finally an erect attitude and progression are taught. Precision of movement can be regained by the use of toys and games. Building blocks, fishing games, jig-saw puzzles, dominoes, pegs to be fitted into holes in a back-gammon board, all have their uses.

A new method of treatment is the use of an *Auto-serum*.³ It consists in the injection into the thecal space by lumbar puncture of about 20 c.c. of blood-serum obtained from 50 c.c. of blood withdrawn from the median basilic vein. The average number of injections is three. Considerable success is recorded as attending the treatment, but it appears an unduly severe procedure for children as nervous as are those suffering from chorea.

W. Ewart⁴ writes in favour of the graduated intensive administration of *Strychnine*, rising from minimal doses to a maximum often surprisingly high.

REFERENCES.—¹*Med. Press and Circ.* 1919, i, 103; ²*N.Y. Med. Jour.* 1919, i, 842; ³*Canad. Med. Assoc. Jour.* 1919, Jan., 52 (in *Jour. Amer. Med. Assoc.* 1919, i, 372); ⁴*Med. Press and Circ.* 1919, i, 185.

CONJUNCTIVA, DISEASES OF.

R. Foster Moore, F.R.C.S.

Ophthalmia Neonatorum.—F. B. Dreyer¹ contributes a valuable paper on ophthalmia neonatorum. He first points out, what is not sufficiently realized, that by no means all these cases are due to the gonococcus, and insists on the importance of bacteriological examination in every case. He analyzes 80 consecutive cases treated by himself with regard to their bacteriology thus :—

Micro-organism.	No. of Cases.	Per cent.	Micro-organism.	No. of Cases.	Per cent.
Gonococcus ..	41	51.25	Morax-Axenfeldt ..	2	2.5
Pneumococcus ..	10	12.5	<i>B. coli communis</i> ..	1	1.25
Koch-Weeks ..	6	7.5	<i>B. subtilis</i> ..	1	1.25
Streptococcus ..	6	7.5	<i>B. pyocyaneus</i> ..	1	1.25
<i>M. catarrhalis</i> ..	4	5.0	Sterile ..	5	6.25
Staphylococcus ..	3	3.75			

The gonococcus, pneumococcus, and streptococcus give rise to severe lesions; the remainder are much less virulent. The importance of prophylaxis is urged, 1 per cent **Silver Nitrate** solution being recommended.

TREATMENT.—The author recommends painting the lids with 2 per cent **Silver Nitrate** solution, or later **Argyrol** or **Protargol**. Also the use of **Normal Saline**, **Boric Acid**, or 1-5000 **Perchloride of Mercury**, as collyria, as frequently as is consistent with the well-being of the infant. He speaks highly of **Blenolenicet Salve**, but does not give the formula.

D. M. Livingstone² gives a favourable account of the value of **Colloidal Manganese** in gonorrhœal ophthalmia. Any improvement in the treatment of this disease will be greatly welcomed. The method was as follows: 1 c.c. colloidal manganese was injected into the buttock as soon as the patient was seen—two days after the onset of the first symptoms. A similar injection was given three days later, and again after four days. Local treatment was also carried out.

Persistent Discharge from the Socket after Removal of an Eye—J. H. McIlroy³ recommends a 1-1000 solution of **Methylene Blue** in normal saline solution.

Chronic Membranous Conjunctivitis.—H. H. Stark⁴ reports the case of a girl whose eyes, mouth, and throat became involved simultaneously by a bullous eruption accompanied by fever. The conjunctiva of the lower lid was covered by a false membrane which could be peeled off entire and was replaced within twenty-four hours. The cornea was apparently not involved, for the vision was $\frac{6}{6}$. The use of a solution of **Quinine Sulphate**, 4 gr. to an ounce, was followed by disappearance of the membrane from both eyes in six weeks.

REFERENCES.—¹*S. Afric. Med. Rec.* 1919, May 24, 147; ²*Brit. Med. Jour.* 1919, i, 404; ³*Ibid.* 405; ⁴*Amer. Jour. Ophth.* 1918, Feb.

CONSTIPATION. (See X-Ray examination, p. 19).

CONSTIPATION IN CHILDREN.

Frederick Langmead, M.D., F.R.C.P.

V. Borland¹ rightly insists that, in the prevention of constipation in infancy, satisfactory hygiene in the home is of paramount importance. Too often a child is given a purge without any inquiry into home conditions, or as to how it is cared for, with the result that it is only temporarily relieved. It would be difficult to exaggerate the value of cultivating regular habits as early as possible, by holding the child over a receptacle at regular times each day. The times best suited are after feeding, when the normal gastrocolic reflex can be utilized. [Borland recommends that this should be done every morning after the meal succeeding the morning bath; but twice or even three times daily is more nearly related to the usual frequency of defæcation in early infancy.—F. L.] If there is any tendency to constipation, the abdomen should be massaged gently with some warm oil over the tract of the colon, commencing in the right groin and ending in the left. If other aid to peristalsis is required, a dose of **Syrup of Figs** or other mild laxative given at night is usually effective. He prefers liquid paraffin to olive oil as a lubricant, since the latter is too readily absorbed. When twenty-four hours have elapsed without a stool, he advocates a **Normal Saline Enema**, but—and we think rightly—disapproves of large enemata, which produce distention and loss of tone, and advises that even small enemata should not be used for long.

Another custom of which Borland disapproves, and which cannot be too warmly condemned, is the promiscuous use of **Castor Oil** for infants with constipation. As he states, the first fault is committed in some cases almost as soon as the child is born. A dose of castor oil is given to clear out the meconium, and thereby the mildly stimulating effect of the colostrum is lost, since the bowel is already tired. Thus is constipation, afterwards difficult to correct, often initiated. Intimately connected with constipation at this age, though often forgotten, are improper and irregular feeding, and insufficient water. When simple hygienic measures do not suffice, he recommends a mixture containing **Cascara**, **Nux Vomica**, and **Liquid Paraffin**.

REFERENCE.—¹*Lancet*, 1919, i, 459.

CORNEA, DISEASES OF.

R. Foster Moore, F.R.C.S.

Fuchs¹ supplies a long and excellent account of the histology of eyes in which the cornea has become affected as the result of pathological changes in the anterior part of the eye, the cornea being invaded from its posterior surface. A comprehensive provisional classification of this type of disease is given. He states that the endothelium may be killed or desquamated; the latter especially where there is pus in the anterior chamber. Descemet's membrane is not less permeable than the endothelium for molecules in solution. The passage of actual cells in large numbers occurs through the intact membrane.

Uhthoff² reports the anatomical findings in a case of *nodular opacity of the cornea*. The sections were made from portions of the cornea that were sliced off. The chief findings were: (1) Localized thickening of the epithelium projecting backwards through Bowman's membrane; (2) Beneath Bowman's membrane were small hyaline masses lying in the corneal layers, which in places were connected through the membrane with the epithelial thickenings; (3) The epithelium was for the most part normal, but here and there contained small hyaline bodies.

C. Jickeli,³ as a result of experimental studies on *lime burns of the cornea*, shows that the resulting corneal opacity is due to the destruction of the tissues, and not to the deposition of lime in the tissues. Chemical solutions which have for their object the solution of the deposited lime are not only useless, but sometimes make the opacity more dense. When the burn is produced by pure calcium hydroxide, no deposition of lime in the tissues takes place.

Under the title of *dumb-bell keratitis*, Haynes Buxton⁴ describes an unusual form of disease. The condition is described as starting as a small greyish-white ulcer, circular in shape, 2 mm. inside the sclerocorneal margin above. From it extended a comet-like tail which ultimately reached right across the pupil till, having reached a spot 2 mm. from the sclerocorneal margin below, another head was found precisely similar to the one above, resulting thus in a symmetrical dumb-bell-like figure. No specific organism was found.

The idea of replacing an opaque portion of cornea, which is spoiling the sight, by *grafting in a transparent portion*, is so attractive as always to raise interest. A. Magitot⁵ contributes a comprehensive paper on the subject. He deals first with the anatomy of the cornea, and the method of regeneration of corneal tissue. He classifies grafts as: (1) *Autoplastic*, when the graft is taken from the same individual—this gives much the best results; (2) *Homoplastic*, when the graft is obtained from an individual of the same species—here the results are favourable, but not so good as in autoplasty; and (3) *Heteroplastic*, when the graft is from an individual of a different species. Heteroplasty in man has so far provided nothing but failures; autoplasty in man has given 95 per cent successes, and homoplasty 60 per cent. The most favourable

cases are nebulæ left by ulcers or superficial burns, and where the cicatrix does not extend so deep as Descemet's membrane. If Descemet's membrane is involved, total keratoplasty alone is of value, and the results are not good. The graft should not be thick, for it is the epithelium and the immediately underlying tissue which alone are of value; further, it swells to twice its thickness by imbibition of water whilst it is being cut. The best method of cutting the graft is by means of a 4- or 5-mm. Bowman's trephine. Anyone interested in this matter must read Magitot's interesting and extensive work.

S. Walker, jun.,⁶ as a result of experiments on dogs, brings forward a different method of corneal grafting. This consists in covering the area to be grafted with a Thiersch graft cut with a Graefe's cataract knife. The graft itself is then actually sewn in position by means of four fine sutures passed just sufficiently deeply to hold, and the whole is then covered by freeing the ocular conjunctiva from seven to four o'clock on the dial, so that this can be pulled down to cover the area, and sewn there without tension. Forty-eight hours later all stitches are removed. The author states that with properly selected cases this operation will give fair results.

Pringle⁷ reports a case of *infection of the cornea with a gas-forming organism*, with gas formation; he mentions two other cases, in which, however, there is no satisfactory evidence that gas formation in the cornea occurred, although in one case apparently a gas-forming bacillus was present.

The Formation of Clear Spaces in Corneal Nebulæ.

Holmes Spicer⁸ contributes a classical paper on this subject, which is almost entirely a new one. The paper is the outcome of many years of most accurate study and observation. The mode of development of the corneal changes has been made out by means of pencil drawings done from time to time. These drawings made by the author are exceedingly beautiful; twenty-two are published in the paper, but they represent a selection only from the many scores on which the facts recorded are based.

First the types of corneal vessels are described: These are four in number (Fig. 4). Veins are usually accompanied by one or two small arteries; they are larger and darker than the arteries, and the transition from artery to vein can be seen to take place without the intervention of capillaries. Further, vessels usually keep to their own layer in the cornea; they do not anastomose with those of a different layer; thus, tufts of vessels in the corneal substance may be seen to cross each other and to break up into their finest branches without communicating, provided they are at different levels (see Fig. 4).

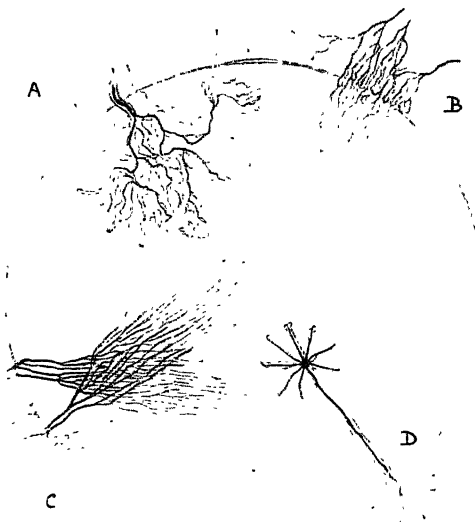


Fig. 4.—Types of vessels in the cornea. A, Arborescent type. B, Terminal loop type. C, Brush or besom type. D, Umbel type.

The clear lines are divided into two groups: (1) 'Geometrical lines'; (2) 'Mushroom cap'.

1. '*Geometrical Lines*'.—These are perfectly clear lines in which no trace of haze, opacity, or structure can be seen; they lie in the midst of nebulae. They are perfectly straight, or run in large smooth curves; they are sometimes parallel, sometimes diverging or converging or crossed by other lines, or radiating from a centre. They are often so perfectly straight and sharply cut that they appear like machine-ruled geometrical figures. They are often much broader than any possible vessel. These lines have as their basis the tracks of old vessels (see *Plate VII, Figs. A and B*, in which their development was traced). Of 25 cases, 6 were due to interstitial keratitis, and 11 to deep ulcers.

2. '*Mushroom Cap*'.—This type of opacity has the appearance that a section of a mushroom would have if carried through the side of the stalk, its top being surrounded by the crescent-shaped head, with the gills on its concave surface. The stalk is of a delicate blue-grey colour; there is an interval of clear cornea between it and the head. The head of the mushroom is crescent-shaped, densest at its concave edge, and fading to nothing at its convex edge; it contains no trace of blood-vessels. The concave edge is feathered like the gills of a mushroom (see *Plate VII, Figs. C, D*). A number of these mushroom-cap systems may be present in the same cornea and may overlap each other (*Fig. D*). The author makes it quite clear that these are not the scars of ulcers themselves, for they appear a certain time after an ulcer has come to an end; he quotes cases in which they were observed to develop in one case nine months, and in another four months, after the healing of the ulcer. He states his views as to the actual mode of their formation.

Ring Infiltration of the Cornea.—D. V. Gird⁹ records in full detail a case of ring infiltration of the cornea in which regression occurred in a child of 13 suffering from Henoch's purpura. He goes on to discuss in much interesting detail the pathology of infiltrations of the cornea in general. It is a very interesting contribution, to which an abstract can do no sort of justice; it will well repay reading in full. The different views of Leber, Fuchs, Trautmann, Collins, and Parsons, to account for the ring appearance wherever the original wound may be, are discussed in detail.

The author's explanation of the infiltration in ring form is shortly as follows: Toxins are diffused throughout the whole of the avascular cornea from the point of infection; this calls forth an immigration of leucocytes from the limbal loops and anterior ciliary vessels all round; but seeing that ring abscess only occurs in cases where either the resistance is low or the organism is of special virulence, the advance of the leucocytes towards the corneal centre is soon held up, with the consequent formation of a ring of infiltration.

Corneal Ulcer.—Cavara¹⁰ has a very long and exhaustive paper on the value of *Optochin*. It may be used as drops at a strength of 2 or 12 per cent, or may be employed for touching a corneal ulcer at a strength of 5 per cent. Fifty-five cases of *ulcus serpens* are recorded, treated by 1 or 2 per cent watery solution, which was applied hourly for half to one minute on each occasion. The author speaks strongly in favour of this method of treatment for ulcers of the cornea which are due to the pneumococcus. Stengele¹¹ also speaks very favourably of this drug in 1 per cent solution, as also does Basterra,¹² more especially for *pneumococcal infections* of the cornea. [One wonders whether new drugs, because they are new, will ever cease to work miracles.—R. F. M.]

REFERENCES.—¹*Klin. Monatsbl. f. Augenheilk.* 1915, Feb.-March, 194; ²*Abstr. in Brit. Jour. Ophth.* 1919, Aug., 374; ³*Arch. f. Ophthalm.* 1916, xci, pt. 3; ⁴*Med. Press and Circ.* 1919, ii, 28; ⁵*Ann. d'Ocul.* 1916, Sept. and Oct.; ⁶*Ophth. Rec.* 1917, Aug.; ⁷*Brit. Jour. Ophth.* 1919, March, 110; ⁸*Ibid.* Jan., 1; ⁹*Ibid.* 1918, Dec., 611; ¹⁰*Klin. Monatsbl. f. Augenheilk.* 1915, June, 601; ¹¹*Ibid.* April-May, 446; ¹²*Arch. d. Oftal. Hisp. Amer.* 1917, Dec.

PLATE VII

FORMATION OF CLEAR SPACES IN CORNEAL NEBULÆ

(HOLMES SPICER)



Fig. A.

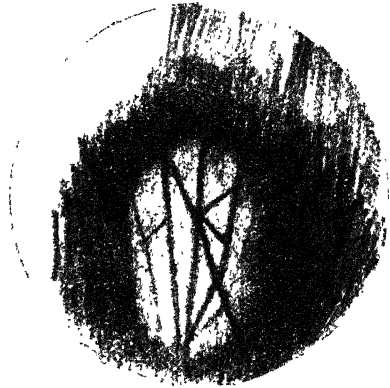


Fig. B.



Fig. C.



Fig. D.

Figs. A, B.—Interstitial vessels which afterwards become geometrical lines. *Fig. C.* Geometrical lines and mushroom heads. *Fig. D.*—Three mushroom heads on one stalk, the result of three leech ulcers.

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DEAFNESS. (See also EAR DISEASE ; VESTIBULAR APPARATUS IN RELATION TO NEUROLOGY.)

John S. Fraser, M.B., F.R.C.S.

The Pitch Range Audiometer in Otology.—Two years ago Dean¹ decided that the methods of testing the tonal range used in his clinic must be improved upon. Prof. Seashore suggested the appointment of a research assistant to work in otology and psychology to solve this problem. Bunch was appointed, and the new instrument is the result of his work. Dean admits that it is not a perfected machine. It is, however, far superior to any other. "As perimetry has developed ophthalmology, so may this method develop otology". In Dean's clinic the pitch range audiometer has already replaced tuning-forks, as it is a great time-saver. The instrument was used during the war to test men for active service, and many unsuspected defective individuals were found who had passed the other regular examinations for hearing. The audiometer

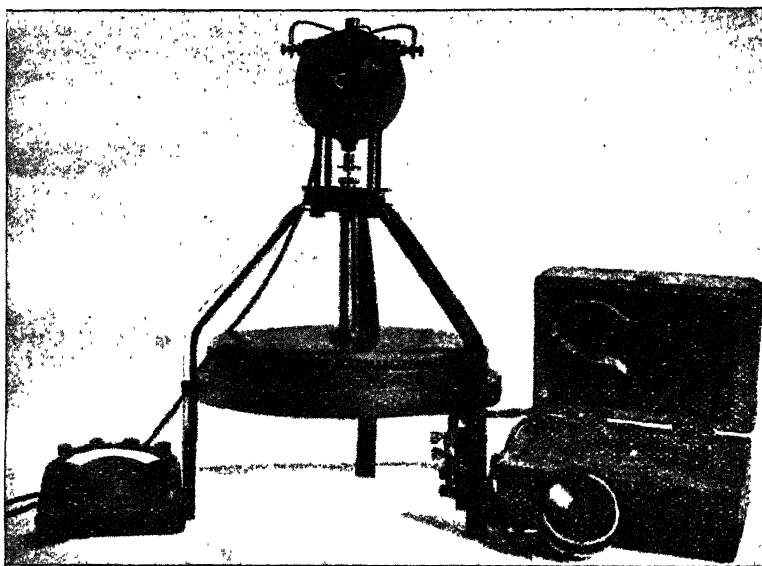


Fig. 5.—Pitch range audiometer—new model. (Reproduced from 'The Laryngoscope'.)

measures the tonal range from 30 to 10,000 double vibrations per second. Defects unsuspected after an examination with the Bezold forks, covering over an hour, are detected in two or three minutes with this instrument. A tone gap, of three or four notes only, lying in an area between two tuning-forks, will be definitely demonstrated by this method. These findings have been confirmed with the monochord and piano. The new instrument is also excellent for rapidly and accurately determining malingering. Curves made on successive days should be identical unless the ear condition is changing or the patient is malingering. In testing the hearing of one ear, it is always necessary to use a noise apparatus in the other. (Fig. 5.)

Dean gives a brief description of the instrument: If we take a magnet such as that used in a telephone receiver and attach to it another telephone receiver, and then lay a nail across the two prongs of the first receiver, we

can hear a click in the other receiver when the nail is laid on and when it is taken off, as a result of the change in the electromotive force caused by bridging the two points of the magnet. If we mount this receiver magnet in front of a toothed wheel so that each prong of the magnet will fit snugly in front of one tooth of the wheel, then the wheel becomes a bridge as the nail was in the first experiment. The magnetic current completes a circuit from one cog to the other. Now, if the wheel is revolved slowly, the cogs gradually recede from their magnetic points until they reach the maximum gap, and then the next pair of cogs will gradually make the bridge as before. The pitch of this tone may then be varied by varying the speed of the revolving wheel. The wheel is driven by a direct current motor so adjusted as to produce any desired speed. The noise of the machinery may be eliminated by placing the motor in some distant room and having electric control for the experimenter, who is seated in a quiet room with the patient. The patient holds the receiver to his ear and indicates by some noiseless method that he hears the tones. The experimenter begins by throwing in the shunt a certain resistance which will give a strong tone in the receiver. The motor is then speeded up until the entire tonal range is covered. A convenient method of marking the graph is to have the intensity steps for the vertical scale, and the frequencies recorded at the bottom as a horizontal scale. Fatigue is largely eliminated, because the pitch of the tone is constantly changing, and the entire test should not require more than fifteen or twenty minutes.

Deafness Associated with the Stigmata of Degeneration.—Hugh E. Jones² suggests that there is a kind of deafness due to inborn degeneration of one or more sets of neurons which connect the ganglion spirale in the cochlea with the brain cortex, and that this condition is associated with degeneration of other more or less remote epithelial tracts. These associations have diagnostic value. By classifying and counting ears in trams, trains, and public assemblies, Jones has satisfied himself that defective auricles do not occur oftener than 1 in 5 of the general public. On the other hand, among 210 consecutive hospital (out-patient) ear cases, Jones found that 185 (64 per cent) showed auricular defects such as are associated with degeneracy (*vide infra*). In the cases of chronic tympanic catarrh and otosclerosis, the proportion was 49 defective auricles to 9 good ones, while in nervous affections of various kinds the figures were 22 to 3. In what may be termed 'accidental' affections the proportion was 35 bad auricles to 41 good. Of 158 consecutive eye patients, 129 had good lobules, 14 had doubtful ones, while 15 only had definitely defective auricles. In a case with loss of bone conduction on both sides, Jones noted cleft helix, attached lobule, and Darwin's tubercle. Amongst individuals generally with sound and defective hearing, the proportion of good to bad auricles is about 5 to 1; but taking the deaf alone, the proportion is over 60 per cent defective auricles; while if degenerative deafness cases only are taken, the proportion rises to at least 5 defective auricles to 1 normal. The fatigue reaction is generally prominent in these cases. Jones believes degeneration to be the predisposing cause of many diseases of both middle and internal ear. It makes the organ more vulnerable and less amenable to treatment. *The sites of the main degeneration lesion*: Jones agrees with Mott that the neuron, like other cells, depends for its development, life, and functional activity upon a suitable environment. It must also possess an inherent vital energy. Jones does not imply that all or even many individuals exhibiting minor defects of the pinna have criminal tendencies or defective mental powers. His suggestion is that such defects of the pinna are associated mainly with localized *actual* or *potential* degenerations of the auditory nerve tract.

As examples of auricular defects, Jones mentions cleft helix, attached lobule,

Darwin's tubercle, too deep a cleft between the lobule and cheek—which, carried to an extreme, would be a cleft between the tragus on the one hand and the antitragus and lobule on the other. The 'Morel ear', which is specially associated with criminality, is a narrow ear with a fairly long lobule attached along its whole anterior border.

In the discussion following Jones's paper, Stuart-Low stated that he had found that deaf patients heard better after a good laugh. Banks-Davis was doubtful about the accuracy of Jones's observations concerning mal-development of the auricles. With regard to otosclerosis, especially in women, he had often been surprised to notice how beautifully formed were the auricles of these people. Kelson had heard that in tuberculous people the tissues of the lobule were so weak that ear-rings often cut out. Mollison stated that cases of quantitative loss of hearing seemed to be extraordinarily rare.

[Jones's paper would be more convincing if he had omitted cases of otosclerosis and chronic tympanic catarrh—which are due to disease of meso- or hypoblastic tissues—and had confined himself to cases of nerve deafness and congenital deaf-mutism—which are concerned with tissues derived from the epiblast. On the other hand, one would imagine that mal-development of the auricle was due not so much to defect of its epidermic covering as to abnormality of the underlying mesoblastic cartilage and connective tissue. Further observations on this subject should certainly be made. Jones cannot have it both ways.—J. S. F.]

Lip-reading.—Kessler³ states that three months after the war began in Europe, Germany provided classes in lip-reading. Within a short time three deafened soldiers (two lawyers and one teacher) were enabled to follow their regular vocations through such instruction. Kessler found that among 15 more or less deaf persons, who had become enthusiastic lip-readers, only 3 had heard of speech-reading through their aurist. The others obtained their information from friends or newspapers. Many of the ills of deafness could be prevented if lip-reading were prescribed to the *slightly deaf* before their deafness becomes a source of embarrassment. Deaf people spend time and money on nostrums, which do no good, with the result that they finally assume the attitude that nothing is worth while. They can then hardly be persuaded to rouse themselves sufficiently to study lip-reading. When the deaf man realizes that he can again understand the quietly spoken word, his attitude towards life is changed.

REFERENCES.—¹*Laryngoscope*, 1919, Aug., 453; ²*Proc. Roy. Soc. Med. (Otol. Sect.)*, 1919, March, 17; ³*Laryngoscope*, 1919, March, 163.

DEFICIENCY DISEASES. (See also **BERI-BERI**; **INFANT FEEDING**; **LATHYRISM**; **PELLAGRA**; **RICKETS**; **SCURVY**; **VITAMINES**.)

Herbert French, M.D., F.R.C.P.

McCarrison¹ has made a special study of the phenomena of disease due to deficiency of certain accessory food factors, using pigeons for his experimental work. The full details of his researches will be published in the *Indian Journal of Medical Research*, but an abstract is given here. He points out that besides the more defined deficiency diseases such as beri-beri and scurvy, there is much to indicate that many of the minor maladies, particularly in children, may be the result of incomplete provision of these accessory substances in the dietary; he is inclined to think that cases of bilious vomiting, cyclical acidosis, mucous disease, and other metabolic disorders, are of this nature; and he draws the attention of physicians, especially those connected with the great children's hospitals, to the effects of vitaminic deficiency, not only on the central nervous system, but also on the liver, pancreas, spleen, pituitary, thymus, thyroid,

reproductive organs, and adrenal sympathetic system. His general conclusions, based upon clinical, morbid, anatomical, histological, and bacteriological observations, are as follows :—

1. The absence of certain accessory food factors from the dietary—improperly termed ‘antineuritic’—leads not only to functional and degenerative changes in the central nervous system, but to similar changes in every organ and tissue of the body. The morbid state to which their absence gives rise is not a neuritis.

2. The symptom-complex resulting from the absence of these substances is due (a) to chronic inanition, b) to derangement of function of the organs of digestion and assimilation, (c) to disordered endocrine function, (d) to malnutrition of the nervous system, and (e) to hyperadrenalinæmia.

3. Certain organs undergo hypertrophy; others atrophy. Those which hypertrophy are the adrenals. Those which atrophy, in the order of severity named, are the thymus, testicles, spleen, ovary, pancreas, heart, liver, kidneys, stomach, thyroid, and brain. The pituitary gland showed in adult birds a slight tendency to enlargement in males only.

4. The enlargement of the adrenals is a true hypertrophy in so far as it is associated with a proportionate increase of the glands’ adrenalin content. The quantity and quality of adrenalin in the hypertrophied organ is, area for area, approximately the same as that found in the adrenals in health. The hypertrophy is equally well marked in both sexes.

5. Œdema was invariably (100 per cent) associated with great hypertrophy of the adrenal glands, while 85 per cent of all cases having great hypertrophy of these organs had œdema in some form. The amount of adrenalin, as determined by physiological methods, in such cases has been considerably in excess of that found in cases not presenting this symptom, and greatly in excess of that found in normal adrenals.

6. Inanition gives rise to a similar state of adrenal hypertrophy, and to a similar state of atrophy of other organs, the brain excepted.

7. The œdema of inanition and of beri-beri is believed to be initiated by the increased intracapillary pressure which results from the increased production of adrenalin, acting in association with malnutrition of the tissues. Failure of the circulation and venous stasis may subsequently contribute to it. Age is an important factor determining its occurrence. This finding is held to account in great measure for the occurrence of ‘war œdema’ amongst prisoners of war in Germany.

8. Wet beri-beri and dry beri-beri are essentially the same disease; the former differs from the latter in the greater derangement of the adrenal glands.

9. Gastric, intestinal, biliary, and pancreatic insufficiency are important consequences of a dietary too rich in starch and too poor in ‘vitamines’ and other essential constituents of the food. It is suggested that some of the obscure metabolic disorders of childhood might be examined from this viewpoint, as well as from that of endocrine-gland starvation.

10. A state of acidosis results from the absence of so-called ‘antineuritic vitamins’; this state is due to the imperfect metabolism of carbohydrates and to acid fermentation of starches in the intestinal tract. Clinically it is evidenced by progressive slowing and deepening of the respiration.

11. Great atrophy of muscular tissue results from deficiency of accessory food factors; it is due in part to the disturbance of carbohydrate metabolism in consequence of disordered endocrine function, in part to the action of the adrenals in supplying blood to the vegetative organs of the body at the expense of the muscles.

12. Profound atrophy of the reproductive organs is an important consequence of ‘vitaminic’ deficiency. It leads to the cessation of the function of spermat-

genesis. In the human subject such degrees of atrophy would result in sterility in males, and in amenorrhœa and sterility in females. This finding is held to account in great measure for the occurrence of 'war amenorrhœa'.

13. The central nervous system atrophies little; paralytic symptoms, when they occur, are due mainly to impaired functional activity of nerve-cells; much more rarely to their degeneration.

14. It is thought that, because of their atrophy out of all proportion to other tissues, the thymus, testicles, ovary, and spleen provide a reserve of accessory food factors for use on occasions of metabolic stress. This reserve, however, is rapidly exhausted.

15. The bones are thinned, and there is a loss of bone-marrow.

16. The red cells of the blood are diminished by about 20 per cent.

17. The whole morbid process is believed to be the result of nuclear starvation of all tissue-cells. Even the adrenals, which alone of all organs of the body undergo enlargement, show on section changes in some of their cells indicative of nuclear starvation. Accessory food factors are nuclear nourishers.

18. Finally, although deficiency of certain accessory food factors is the essential etiological agent in the genesis of beri-beri, it is held that infections and parasitic agencies are often important causes determining onset of symptoms.

'Vitaminic' deficiency renders the body very liable to be overrun by a rank growth of bacteria.

War Œdema.—The way in which McCarrison finds that the occurrence or non-occurrence of œdema in beri-beri cases is to some extent accidental, without constituting any essential difference in the two main types of the disease, is supported by the way in which deficient and defective dietary under war conditions led to inanition without œdema in some districts, and to a peculiar condition described as 'war œdema' in others. The description of the cases is much the same. The œdema has often been extreme, and even in the milder cases it is of the type which at once suggests Bright's disease as its cause. Albumin has occurred in the urine in not a few cases, but in many others there has been none, and the general consensus of opinion is that these war œdema cases are not the result of nephritis, but of prolonged deficiency in some of the ingredients of a healthy dietary over and above a dietary which is in itself inadequate as regards the total calories per diem. In this respect war-œdema is analogous to the œdema of a certain type of beri-beri case. This condition has been particularly common in certain districts on the Continent. Von Joks³ records that in Bohemia alone in 1917, 22,842 persons developed this hunger œdema, and 1028 died of it. Many other papers upon the subject are quoted in the *Medical Review of the Foreign Press*.³ It seems that the disease appears wherever the number of calories in the diet falls below 1400, which is the minimum for the preservation of health for persons engaged in the lightest work, and deficiency in carbohydrates and fat is more important than deficiency in proteid. Men are affected more than women, and adults more than children, and it is an affection of the poor. The principal symptoms are bradycardia, dropsy, and polyuria, in addition to loss of flesh, and it is probable that the dropsy, which is the most striking feature of typical cases, is not absolutely essential, bradycardia and polyuria without œdema constituting the same malady in others. Albuminuria is generally absent; the pulse-rate may fall to 48 or 40 before there are other manifestations of the disease; a week or two later slight swelling of the eyelids or legs appears, and another early symptom is a remarkable dryness of the skin of the legs, accompanied by branny desquamation.

Post-mortem findings are recorded by Oberndorfer.⁴ They were almost always the same. There was no trace of fat even on the heart, and wasting of

the muscles was very pronounced. The flaccid condition of the whole body was so marked that rigor mortis was hardly ever developed. The œdema was most evident in the lower limbs and scrotum. With hardly any exceptions there was an effusion of from one to two litres of clear fluid in the abdominal cavity, and there were smaller effusions in the pleuræ and pericardium; the meninges also were soaked with fluid. All the organs were much reduced in size, the weight of the heart being sometimes below 180 grm., and hardly ever as much as 250 grm., as compared with the normal weight ranging from 250 to 320 grm. The coronary vessels attracted notice from their prominence, resulting from the loss of epicardial fat in which they should be buried. The weight of the kidneys was reduced in proportion to that of the heart, so that the two kidneys together weighed still the same as the heart—a fact which is all the more striking, as the urinary excretion was remarkably high and the kidneys had presumably been performing much work. Brown atrophy of the spleen was the rule, and its weight was sometimes as low as 50 grm., as compared with the normal 150 to 180 grm. The liver showed brown atrophy, and the weight was sometimes reduced to 950 grm. The thyroid gland was often markedly atrophic, in one case weighing only 12 grm. There was œdema of the connective tissues generally, the mesentery being specially affected, and the serous coat of the lower part of the large intestine hung down in large loose folds. In almost all cases there was severe inflammation of the large intestine, varying from the ordinary appearance found in dysentery, to a gangrenous destruction of almost the entire intestinal wall; but whether this is an essential part of the disease, or an added factor in the fatal cases, was not determined.

Though regarded by most as a diet deficiency disease pure and simple, and thus related to beri-beri, some regard it as due to atrophic changes in the thyroid gland, bringing it thus into line with myxœdema.

As regards treatment, drugs are not required, provided that the patient can be put to bed and given a more generous and varied diet than that which had been associated with the oncoming of the malady.

Hunger-osteopathy.—Porges and Wagner⁵ record another peculiar starvation disease which they term 'hunger-osteopathy'. The cardinal symptoms are sharp pains in the pelvis and in the epigastrium, extending to the lower parts of the thorax, especially along the rib margins, so that the patient becomes either totally unable to move, or can only drag himself along with short painful steps. The incapacitation of the patient is obvious enough, and yet there may be few objective signs to prove his sufferings. There may be more or less tenderness to pressure over the crests of the ilium, or over the lower ribs, but little else; skiagraphy either shows normal bones, or at the most an undue clarity as though there were a diminution in their calcium contents. Most of the patients were of the type that had suffered from rickets in children, and a common factor to all of them was deficiency in diet, both as to total amount and as to variety during the preceding several months. The malady, however, was not confined to soldiers, for similar cases occurred amongst women who had been obliged to live under similar conditions; muscle tests in these cases showed no particular hypersensitiveness, but there was a marked tendency to spasmodic contractures in some cases, reaching a degree similar to that of tetany, and associated here and there either with Chvostek's or with Trousseau's phenomenon.

It seems likely that this hunger-osteopathy, therefore, is not confined to the bones, but affects the muscles, and though due to chronic diet deficiency, is allied to tetany. The cure is a return to normal dietetic conditions.

REFERENCES.—¹*Brit. Med. Jour.* 1919, i, 177; ²*Wien. klin. Woch.* 1918, lxxviii, 1029-36; ³*Med. Sup. Rev. Foreign Press*, 1918, Nov. 1, 391; ⁴*Munch. med. Woch.* 1918, lxxv, 1191; ⁵*Wien. klin. Woch.* 1919, April 10, 385.

DEMENTIA PRÆCOX.

Bedford Pierce, M.D., F.R.C.P.
Marguerite Wilson, M.B., Ch.B.

Kraepelin defines dementia præcox as consisting "of a series of states, the common characteristic of which is a peculiar destruction of the internal connections of the psychic personality. The effect of this injury predominates in the emotional and volitional spheres of mental life".

Osinato¹ states that it is now undoubted that dementia præcox is an organic disease of the brain. Southard supports this view, and is quoted as having found in 86 per cent of cases coarse or microscopic lesions. Mott finds that the cortical change in dementia præcox is one of nuclear decay and degeneration—"progressive degeneration of the nucleus and the nucleo-protein basophil substances of the neurones, unattended by vascular, perivascular, or meningeal changes". The neurones of the same layers are not equally affected. One would expect vascular changes if the degeneration were due to a circulating toxin. Forster has found regressive changes in the ovaries, and Mott in the testes.

Jung² states that neurasthenia might be regarded as a mild form of dementia præcox. He has found no histological changes in the brain in phobias, obsessions, paranoia, hysteria, katatonia, or dementia præcox. At times there are changes present in dementia præcox, but he suggests that the toxins which produced these changes are secondary factors. He points out the common failure there is to appreciate the psychogenic origin of disease—i.e., "disease of mind as distinct from disease of brain".

It is agreed that the classification of this disease is unsatisfactory. Kraepelin suggests classification according to degree of dementia—simple, silly, simple depressive, delusional depressive, etc. He admits that certain cases do recover, and that these recoveries may occur after apparently extreme deterioration and yet show memory for all that has passed.

Pollock³ has discussed dementia præcox as a social problem. He quotes Kirby and Bleuler, who state that many cases of dementia præcox develop without hallucinations or pronounced trends, and on account of absence of psychotic symptoms rarely reach hospital, but go to swell the great population of tramps, beggars, chronic loafers, and poor-house inmates. In New York State, 53-81 of the total asylum populations is composed of cases of dementia præcox. The number of persons suffering from dementia præcox exceeds the total number of poisoners, epileptics, feeble-minded, and all other inmates of the State charitable institutions taken together. As regards age of incidence, in every 100 cases, 8 entered the asylum before reaching 20 years of age; 43 before reaching 30 years; 30 before reaching 40 years; and 19 were over 40 years. Fifty per cent were found to have unfavourable family histories, insanity, nervous diseases, or alcoholism being present. The circumstances of the patients were investigated, and 71 per cent of the cases were those who were self-supporting or practically so; only 17 per cent occurred in dependents; and 12 per cent in persons in comfortable circumstances. The great bulk of the cases came from cities.

TREATMENT.—Extracts of ductless glands have been tried, especially pituitary and thyroid, without success. Many authorities recommend psycho-analysis in early stages; others report this method of treatment not only useless but extremely harmful.

REFERENCES.—¹*Jour. Nervous and Mental Dis.* 1919, June, 492; ²*Lancet*, 1919, July 19 (Rep. Proc. Roy. Sec. Med.); ³*Mental Hygiene*, 1919, iii. No. 4, 575.

DERMATOSES, INFECTIVE. (*See SKIN, INFECTIVE CONDITIONS OF.*)

DIABETES INSIPIDUS.*John D. Comrie, M.D., F.R.C.P.*

A study was made by Clausen¹ of the urinary output of a nine-year-old boy suffering from diabetes insipidus, as influenced by injections of **Pituitary Gland Extract**. There was a marked decrease of the amount of urine following upon the injection of 0.25 to 1 c.c. of the usual pituitary solution. This diminution persisted for five or six hours, and sometimes longer, and, injected at any time during the day, the pituitary extract reduced the volume of the following night's urine. He found that the rate of excretion of chlorides was distinctly, and of urea, creatinin, and uric acid, slightly, reduced after the injection. Kennaway and Mottram² record a minute study of two cases in which diabetes insipidus was present. In a considerable number of cases in the literature of the subject, this condition has been associated with disease of the posterior lobe of the pituitary body, though the evidence is inconclusive as to any essential connection between the two. These authors also found that the injection of a moderate amount causes a diminished flow of urine for several hours, compensated later by an increased flow. **Strychnine** or **Ergot** is also of benefit in treating diabetes insipidus.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, Sept., 1089 (abstr. from *Amer. Jour. Dis. Children*, 1918, Sept. 16, No. 3); ²*Quart. Jour. Med.* 1919, April, 225.

DIABETES MELLITUS.*John D. Comrie, M.D., F.R.C.P.*

The principal development of importance in the knowledge of diabetes during the past year has been in the researches made into the clinical significance of blood sugar, and especially of the blood-sugar threshold. This is that percentage of sugar in the blood at which glucose begins to find its way out into the urine. Williams and Humphreys¹ contribute to the elucidation of this subject three papers in which they deal very fully with questions regarding the blood sugar. The sugar in the blood was estimated by the Lewis-Benedict method. In an examination of 113 normal individuals they found that the amount varied from 0.07 to 0.14, with an average of 0.107 per cent. In carcinoma it was slightly raised, varying in nine cases from 0.12 to 0.16 per cent. In early nephritis it did not vary from the percentage found in a normal individual, but in advanced nephritis there was always a tendency for the blood sugar to rise, so that the examination was found to be of importance in prognosis, since the rise came on only after failure of nitrogen metabolism had been present for many months. In early cases of diabetes, while the blood sugar is high, the renal threshold may be not much raised above the normal, with the result that large quantities of sugar appear in the urine on an ordinary diet. Thus, for example, in one case, a patient on admission to hospital was found to have 0.67 per cent of blood sugar, which sank under treatment so that his threshold, below which no glucose appeared in the urine, was found to be 0.17 per cent of sugar in the blood. When the disease became progressive these workers found that the threshold tended to rise, so much so that before death sometimes the blood sugar might reach great heights with little or no sugar appearing in the urine. The threshold was found before death in some cases to be 0.2 or 0.3 per cent. They conclude that in the treatment of diabetes it is desirable to maintain the blood-sugar level as nearly normal as possible, even though severe restrictions in diet may be necessary for this purpose, notwithstanding the fact that the high threshold will permit of a much more liberal diet without the appearance of sugar in the urine. They therefore think that diabetes should be controlled on the basis of the blood-sugar level rather than by urine tests, and that the aim should be to keep the level not higher than 0.13 per cent. Lepine² also points out that many diabetics have a fairly low percentage of blood sugar, falling well below 0.2 per cent, and that very many

do not reach 0.3 per cent, the figure which Claude Bernard considered represented the normal threshold. Indeed, Langstroth³ records a case of persistent glycosuria, with apparently normal kidneys, in which the blood-sugar threshold was below normal. Hamburger,⁴ by experimental methods, has demonstrated that the glomerular epithelium has the power of retaining free glucose, while l  vulose and lactose pass through into the urine freely. If, however, the glucose is present in a high concentration, the glomerular epithelium becomes damaged and allows the glucose to pass, the permeability being greater the higher the percentage of glucose in the transfusion fluid.

A method of differentiating various sugars that may be present in the urine, through their special fermentability, by strains of bacteria, is given by Castellani and Taylor.⁵ The method is applicable only in a bacteriological laboratory where many strains of bacteria are constantly obtainable. For example, to distinguish lactose from glucose, if the suspected Fehling-reducing urine be sterilized and then put up in two specimens, one with *B. coli* and one with *B. paratyphosus B*, gas-production in the latter shows that the reducing sugar is lactose. Similar bacterial formul  e are given for most of the other sugars.

The gradual increase in the death-rate from diabetes mellitus in the United States is pointed out by Dublin,⁶ who has made an analysis of the experience of the Metropolitan Life Insurance Company and also of the data from the American Registration Area. He finds that the deaths per 100,000 due to diabetes have been in 1911, 13.3; in 1912, 13.7; in 1913, 13.9; in 1914, 14.2; in 1915, 15.1; and in 1916, 15.9.

Renal diabetes, or, as he prefers to call it, renal glycuressis, is defined by Bailey⁷ as a condition of glycuressis not dependent on any temporary increase of blood sugar, and occurring in an individual free from symptoms of diabetes mellitus. The condition can best be recognized, he says (and recognition is important because of its relatively innocuous character), by making an examination of the blood and of the urine at the same time in the morning, before the patient has had anything to eat or drink. In some cases glucose is found in the urine, although the blood sugar is normal in amount, or even subnormal; and in others the amount of glucose varies according to the amount of urine, but is little influenced by changes in the amount of blood sugar.

The beneficial effect which has been exercised in cases of diabetes in Central Europe by the severe conditions of restricted diet imposed through the war is described by Elias and Singer.⁸ They conclude that the rational diet of the war has benefited diabetics of all grades. Many of their cases of diabetes have become sugar-free and have developed a relatively high tolerance for carbohydrates, while their blood-sugar level has become relatively low or even sometimes normal. This favourable effect is attributed by them above all to the *protein deprivation* of the war diet. They deal with a total of 259 cases, and they experimented in various ways by adding now proteins and now fat and carbohydrates to the diet. They found constantly that the patients progressed most favourably as regarded absence of sugar from the urine when the protein was restricted to 50 or 80 grm. in the day, while a considerable increase of fat and carbohydrate in order to maintain the necessary amount of calories was well borne. Falta⁹ states that he has for many years practised the restriction of protein as the most important principle in the treatment of the diabetic; but that the condition of the general nutrition is to be watched with equal care, and the war diet was unsuited for the latter desideratum in so far as it was very poor in fat.

A careful study of a case of diabetes treated by *fasting* is recorded by Fitz and Bock.¹⁰ On admission the patient had a blood-sugar concentration of 0.58 per cent, and an acidosis sufficient to lower his alveolar CO₂ tension to

20 mm. During the first day in hospital he excreted 116 gm. of glucose. He was therefore critically ill. A seven days' fast was necessary to render his urine free from sugar, and at the end of this period his blood sugar had fallen to 0.17 per cent. After the urine was sugar-free, a systematic daily increase was made on as pure a carbohydrate diet as could be obtained in the form of *green vegetables*. The patient tolerated 150 gm. of carbohydrate without any glycosuria. At the end of 83 days he left hospital in good condition with normal blood-sugar concentration, with trivial acidosis, and apparently in nitrogen equilibrium, upon a mixed diet of protein 75 gm., fat 132 gm., and carbohydrate 50 gm.

Surgical Operations in diabetics often form a difficult question, but according to Labbé¹¹ may be performed if certain conditions be observed. The operation should be preceded by a diet of *dried vegetables*, *oatmeal*, or *milk*, but the usual fast should not be carried out just before the operation. Ethyl chloride is the most suitable general anæsthetic, or **Spinal Anæsthesia** may be employed, and after the operation **Sodium Bicarbonate** should be given to render the urine alkaline.

Carro¹² recommends the great value of the **Alkaline Waters** such as Vichy water, or that of Mondariz, Marmolejo, or Sobron, to those diabetics who are troubled with dyspepsia. In the treatment of diabetic coma, Cammidge¹³ recommends large intravenous injections of **Bicarbonate of Soda** solution, about 1 litre of a 5 or 6 per cent solution, or 1½ oz. of bicarbonate of soda in 30 oz. of water. The injection should be carried out very slowly, and may be repeated in six hours, and again, if necessary, in twelve to eighteen hours. **Digitalis**, **Caffeine**, **Alcohol**, and **Pituitary Extract** are also useful as cardiac stimulants. Donk¹⁴ gives several tables which illustrate the values of protein and carbohydrate contained in various amounts of vegetable, and which therefore enable the physician to prescribe a diet gradually increasing the amounts of different food materials. The following is an illustrative diet, containing 50 gm. of protein and 102 gm. of fat, and providing 608 calories, suitable for administration after a period of fasting:—

Breakfast.—Coffee, half an orange, tomatoes 200 gm., celery 100 gm., lettuce 100 grms.

Dinner.—Broth 300 c.c., potato 60 gm., beet 100 gm., cabbage 300 gm., string beans 300 gm.

Supper.—Potato 30 gm., bread 30 gm., squash 100 gm., turnip 100 gm., spinach 300 grms., watercress 100 grms.

It should be added that Mosenthal and Harrop¹⁵ are not in conformity with most of those who have written in the past year on the subject of diet for diabetics. They consider that a high-protein dietary is the most advisable low-calorie carbohydrate-free diet by which to conserve the body tissues and furnish a maintenance ration for the diabetic.

REFERENCES.—¹*Arch. Internal Med.* 1919, May, 537, 546, 559; ²*Rev. de Méd.* 1916, Nov., Dec., 663; ³*Amer. Jour. Med. Sci.* 1919, Feb. 201; ⁴*Brit. Med. Jour.* 1919, i, 267; ⁵*Ibid.* 1919, i, 183; ⁶*Med. Record*, 1918, Oct., 631; ⁷*Amer. Jour. Med. Sci.* 1919, Feb., 221; ⁸*Wien. klin. Woch.* 1918, Nov. and Dec., 1245, 1365, and 1919, May, 503; ⁹*Ibid.* 1919, April, 398; ¹⁰*Quart. Jour. Med.* 1919, July, 307; ¹¹*Jour. Amer. Med. Assoc.* 1919, Feb. 610 (abst. *Ann. de Méd.* 1918, Dec.); ¹²*Rev. Española de Med. y Cir.* 1919, Aug., 417; ¹³*Lancet*, 1919, i, 60; ¹⁴*Jour. Amer. Med. Assoc.* 1919, July, 25; ¹⁵*Arch. Internal Med.* 1918, Dec., 750.

DIABETES, DIETETIC TREATMENT OF. Robert Hutchison, M.D., F.R.C.P.

Recent advance in the dietetic treatment of diabetes has been the result, as Langdon Brown¹ points out, of convergence between three lines of research: the influence of protein in exciting glycosuria, the value of green vegetable and egg diet, and the value of fasting.

Proteins lead to glycosuria, not only because they contain a carbohydrate fraction in their molecules, but also because they stimulate metabolism. Further, by increasing the external secretion of the pancreas they lessen its internal secretion, as Allen has discovered.

The value of a green vegetable and egg diet was discovered empirically, and is probably due simply to its low nutritive value.

Fasting was first introduced by Guelpa in the erroneous belief that diabetes is the result of an intestinal intoxication. In practice it proved of value, and was put on a more scientific basis by Allen in America, and by Graham in this country. The principles of the new treatment are that "after a preliminary fast, the diet is cautiously increased step by step, and when a certain level has been reached the carbohydrate intake is gradually increased as well. The degree of carbohydrate tolerance can thus be quickly determined, and the diet kept well within this. Days of complete or partial alimentary rest are intercalated as required.

"Perhaps one of the most striking lessons we have learnt from this is, that the control of glycosuria and of acetonuria are not, as we thought, necessarily antagonistic, but can be simultaneous. While it is true that sudden restriction of the carbohydrate intake will lead to acetonuria if a liberal diet of protein and fat takes its place, it is also true that cutting down the whole of the diet practically to zero will be followed by a drop of acetonuria as well as of glycosuria. The normal individual who fasts develops some acetonuria, because he has to live on his fat; but this does not give rise to sufficient diacetic acid to produce toxic symptoms. When the diabetic takes no food, he must produce some of this fasting acetonuria, but this is more than counterbalanced by the drop in the acetonuria which had been produced by a diet poor in carbohydrate but rich in fats. Treatment is thus materially shortened, for formerly we were on the horns of a dilemma—rapid restriction of carbohydrate would produce a toxic acetonuria, while failure to restrict adequately would allow the disease to progress".

The rationale of the 'fasting' treatment seems to consist in its reducing the level of metabolism to a point low enough for the patient's reduced powers of assimilation. It means, therefore, chronic underfeeding, and this implies that some loss of weight is inevitable under it. Naturally also there is a point below which metabolism cannot be reduced and life maintained, and this point is reached sooner or later in the treatment of all progressive cases. The fasting plan, therefore, is no 'cure' for diabetes, though it may prolong the existence of some cases, and against this has to be set the fact that it seems to make the *liability to tuberculosis* as a complication decidedly greater. To many patients also the cure is worse than the disease.

The following is an epitome of Graham's method as carried out by Langdon Brown:—

Two hunger days. Tea and coffee as desired, and 500 c.c. of bovril and broth, made without vegetables, divided into two equal portions. Water or lemonade, sweetened with saccharine, can be taken ad lib.

Followed by—

TWO VEGETABLE AND EGG DAYS.

Breakfast.—Two scrambled eggs, with tea or coffee. 2 oz. (50 grms.) of lettuce, watercress, or tomato.

Lunch.—Bovril or broth, 8 oz. One poached egg on spinach. Any green vegetables, with $1\frac{1}{2}$ oz. of butter. Total amount of vegetables to be 6 to 8 oz.

Tea.—Tea or coffee, lettuce, watercress, or tomato, 50 grms. or 2 oz.

Dinner.—Bovril or broth, 8 oz. Two eggs, cooked as desired, e.g., as savoury

omelette. Green vegetables, 6 to 8 oz. with $1\frac{1}{2}$ oz., of butter. Water or lemonade as desired.

This diet has a calorie value of 1170 and a carbohydrate intake of about 10 grms.

LADDER DIET.

After two vegetable and egg days, add 50 grms. of meat or 100 grms. of fish. This raises the calorie value to about 1300. Two days later, add 50 grms. of bacon at breakfast and omit one egg. Add another 10 grms. of butter to the vegetables. The calorie value is now 1595. Two days later, add 50 grms. of sardines at lunch, and omit one egg, or if the fish has previously been given, omit this and add 100 grms. of meat. The calorie value is now 1835. Two days later, add 50 grms. of ham and omit another egg. The calorie value is now 1795. The quantities of sardines and ham may be doubled if the patient is hungry and the degree of acetonuria is slight. This brings the calorie value up to 2145.

This diet is generally known as the 'ladder diet', and it takes twelve days to reach the top of the ladder. If the patient is free from sugar when at the top, add either 100 c.c. of milk (=4 grms. carbohydrate) or 10 grms of bread (= 5 grms. of carbohydrate in bread). Increase by the same quantity every other day until the limit of carbohydrate tolerance is reached. If the patient is not sugar free when at the top of the ladder, repeat the whole process.

In general terms: Give two consecutive vegetable and egg days once a fortnight, and two hunger days, followed by two vegetable and egg days, once a month, returning to the standard diet, as determined for the particular patient, immediately after these days. But the details of the after-treatment must depend on the individual case. Rest in bed is advisable, at any rate until the calorie value of the food reaches 2000.

REFERENCE.—*Pract.* 1919, Aug., 88.

DIGESTIVE TRACT. For X-ray examination, see p. 20 *et seq.*

DIPHTHERIA.

J. D. Rolleston, M.D.

ETIOLOGY.—In their paper on diphtheria carriers in a military camp, F. R. Keefer, S. A. Friedberg, and J. D. Aronson¹ come to the following conclusions from the study of 686 diphtheria carriers and 461 cases of clinical diphtheria: (1) A single negative culture is only of relative value, as is shown by the fact that pre-operation cultures from tonsils which later proved positive were negative in 22.8 per cent of the cases. (2) The importance of nasal cultures is shown by the fact that in routine cultures taken from carriers, 26 per cent of the nasal cultures were positive. (3) In the great majority of cases the carriers harbour the bacilli in the tonsils; a few carry the germs in the nose only; and a small group maintain the infection in both nose and tonsils. (4) Cultures should be taken immediately before treatment; or, if local treatment is being administered, this should be suspended for a number of days before cultures are taken. (5) In persistent carriers in whom the focus of infection is the tonsils, enucleation offers the only certain procedure for terminating the carrier state (*MEDICAL ANNUAL*, 1918, p. 129). Of 294 carriers operated on, 20 per cent yielded a positive culture from the nose, and 57 from the throat, immediately before operation. After the operation, the following results were obtained: 94 cases (32 per cent) were negative; 136 (46.4 per cent) were negative by the end of the first week; 38 (12.9 per cent) of the second week; 11 (3.7 per cent) of the third; and 14 (4.7 per cent) by the end of from four to eight weeks; 1 case (0.3 per cent) was still positive at the end of four months despite all treatment. (6) In the most persistently positive carriers, acute or chronic infections

of one or more of the accessory sinuses, septal deformities with erosions, or infected adenoid tissue, were present. (7) Intermittent chronic carriers should be employed as attendants in diphtheria wards or in quarantine camps, and should be separated from the hospital staff and from their organizations. (8) Diphtheria patients may be discharged after they have had at least three negative cultures at three-day intervals. Chronic carriers should not be discharged until cultures taken over a long period of time prove consistently negative.

SYMPTOMS.—A fatal case of *diphtheria of the œsophagus*, two examples of which were published by the reviewer some years ago (*see MEDICAL ANNUAL*, 1914, p. 209), is reported by Friedemann², secondary to facial and pharyngeal erysipelas, in a man aged 60. A remarkable feature of the case was the complete immunity of the tonsils and rapid spread of the disease from the pharynx to the trachea and œsophagus, the diphtheritic process obviously following the course previously taken by erysipelas.

J. A. Hartsell and M. L. Morris³ describe an outbreak of *wound diphtheria* among soldiers. Most of the cases occurred in a ward where there were several cases of faucial diphtheria as well as carriers. In none of the cases of wound diphtheria were there any systemic symptoms referable to the diphtheria toxin. The clinical appearances of the wound varied; 12 per cent showed a greyish membrane quite typical of diphtheria; about half presented a faint greyish discoloration of the granulating surfaces which under ordinary circumstances would have passed unnoticed; about 6 per cent looked absolutely healthy. The presence of diphtheria bacilli had apparently no effect on the healing of the wounds, as wounds that were slow in healing invariably had a large number of other organisms present, and wounds that appeared clean progressed in the ordinary way. Diphtheria antitoxin had no effect in ridding the wound of diphtheria, but the most efficacious application was *Tincture of Iodine*, under which treatment the average duration of the positive cultures was six days.

In six cases of *post-diphtheritic paralysis* examined by J. C. Regan,⁴ the cerebrospinal fluid was normal in all except in one patient, in whom the albumin and globulin content was slightly increased. In no instances was there any increase in cells, the cell count never exceeding a total of 7 per cubic millimetre. Lymphocytes were always the predominating type of cell, and in all but one case were the only type present. Reduction of Fehling's solution was normal in all six cases. Macroscopically the fluids were clear and transparent. In most cases there was slight hypertension.

A. L. Hoyne⁵ states that during the quinquennium 1912 to 1916 inclusive, 6817 patients were admitted to the municipal Contagious Diseases Hospital in Chicago. Among this number were 834 deaths, a mortality of approximately 12 per cent. The number of patients under treatment in 1916 was about 200 greater than in 1912, which indicates a marked increase in the prevalence of diphtheria in Chicago at that time. An extremely small number occurred in the coloured race, the negro being relatively immune to diphtheria, as he is to poliomyelitis. The purely pharyngeal and combined pharyngeal and nasal cases constituted nearly 60 per cent of the total deaths. As regards complications, cervical adenitis was noted in 62 per cent; paralysis, usually of the muscles of deglutition, occurred in 9 per cent, not including those in which the heart was involved; 5 per cent suffered from otitis media. Bronchopneumonia was responsible for 137 deaths, and heart failure—usually myocarditis—for 78.

DIAGNOSIS.—The desire for a more accurate means of diagnosis of laryngeal diphtheria led to the adoption at the Willard Parker Hospital, New York, of the almost routine examination by means of the laryngeal speculum. During 1917, over 200 cases of croup were so examined, Gover's paper⁶ being based on

189. Of these, 112 had membrane visible in the larynx, and 77 had none. The duration of croup was slightly longer in the membrane than in the non-membrane cases; 36 of the former and only 1 of the latter were intubated; 26 had membranes above the cords only, 20 membranes below only, and 66 had membrane both above and below. Membrane was noted on the epiglottis only 5 times. In 29 cases membrane was removed from the larynx with forceps; in 23 of these there was marked relief, although in only 14 was the relief permanent; while in 6 there was no appreciable effect. Of the 112 cases with laryngeal membrane, only 59 had membrane in the fauces; and of 77 with no membrane in the larynx, 20 had membrane in the fauces. In 53 cases cultures were taken from the larynx; of those with membrane, 26 were positive and 8 negative; while of those without membrane, 13 were negative and 6 positive; 5 of the latter showed membrane in the fauces. The advantages claimed for laryngoscopy are: (1) In deciding as to the administration of antitoxin in a case of croup without faucial membrane; (2) The necessity of establishing quarantine, immunizing, or Schick-testing contacts; (3) To avoid mistaking a foreign body in the larynx for croup; (4) As regards the necessity for intubation, one may wait for much more marked symptoms of obstruction in catarrhal croup than in the membranous type; (5) The occasional removal of large pieces of membrane with permanent relief.

PROPHYLAXIS.—C. A. Johnson⁷ made a study of the Schick test for diphtheria susceptibility in 500 selected cases, which he classified as follows: (1) Cases which have never had diphtheria or antitoxin; these gave a positive reaction in a large percentage (75 per cent in the first year, falling to 26 per cent between 12 and 21). (2) Cases which had had the disease or had had immunizing doses of antitoxin three or more years previously; this class very frequently showed a reaction (in 50 per cent between 8 and 12, and in 44 per cent between 12 and 21). (3) Cases which presented symptoms of the disease at the time of the test, or had had antitoxin within two weeks of the test; a comparatively small number of cases in this class showed any reaction. (4) Individuals exposed to diphtheria, such as doctors and nurses; these gave a positive reaction in 12 per cent. Johnson concludes that the test will be of great economic value to institutions and to nations in time of mobilization of armies, as, when an epidemic is threatening, only those need be immunized who give a positive reaction. The danger of anaphylaxis will thereby be greatly reduced. The test will also be of great advantage in determining the efficiency of immunization by antitoxin, as well as the natural immunity existing in many persons, or the immunity produced after an attack of diphtheria.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, ii, 1206; ²*Med. Supplement Rev. Foreign Press*, 1919, 127; ³*Jour. Amer. Med. Assoc.* 1919, i, 1351; ⁴*Arch. Pediatr.* 1918, 641; ⁵*Ibid.* 513; ⁶*Ibid.* 281; ⁷*Med. Record*, 1918, ii, 498.

DISSEMINATED SCLEROSIS. (See HYSTERIA).

DRUG ADDICTION. (See ALCOHOLISM AND DRUG ADDICTION.)

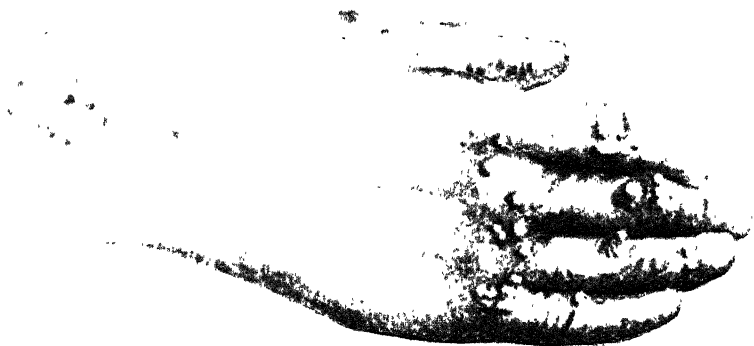
DRUG ERUPTION.

E. Graham Little, M.D., F.R.C.P.

Plate VIII represents a case of skin eruption which followed upon the intravenous injection of $\frac{1}{8}$ gr. hydrarg. perchlor. (liq. hydrarg. perchlor.) in a man suffering from septic endocarditis. The case was under the care of, and will be published in full by, Dr. Redman, who has kindly furnished the picture and notes. The first injection was given on Aug. 23, 1919, and repeated on Aug. 30, and again on Sept. 6 and 13. After the latter injection a vesicular rash was noted on Sept. 17, with the following distribution: forehead, nose, ears, left supraclavicular region, forearms, and hands. The rash

PLATE VIII.

ERUPTION ATTRIBUTED TO POISONING BY
MERCURIC CHLORIDE



E. Graham Little

increased in extent, the lesions became pinker and on an erythematous base, and finally presented the appearance depicted in the water-colour drawing, which was executed by J. Hardwicke Lewis on Sept. 21. Many of the vesicles became hæmorrhagic, and some pustular, so as to resemble small-pox. There were no subjective sensations associated with the rash at any time. No bacterial examination was made of the contents of the vesicles. On Sept. 25 it was noted that the rash was drying up, forming crusting surfaces, and showing pigmentation. The patient died on Oct. 14, and at that time the rash was still visible, but much less evident. Dr. Spillsbury, who made the post-mortem examination, reports: "The skin lesions on the hands, on incision post mortem, Oct. 15, 1919, were found to be subcuticular, and did not extend into the subcutaneous tissues. There was no naked-eye evidence of embolism".

DUCTLESS GLANDS, CLINICAL PATHOLOGY OF. *Oskar C. Gruner, M.D.*

The extensive literature upon this subject contains suggestions of employing laboratory methods for diagnosis, in addition to the purely clinical data hitherto cumstoary. The so-called pluriglandular syndrome includes not only fatigability, abnormal physical growth, enlarged hands and feet, infratemporal headache, low blood-pressure, and vagotonic symptoms, but also changes in the chemical composition of the blood (diminution of the blood-sugar) and of the urine (low urinary purins—Uhlenhuth¹), and in the differential blood-count (Nägelsbach,² Kaufmann³). The ultimate outcome of the use of urinalysis for the detection of defective activity of the ductless glands brings one to a consideration of the extent to which the basal metabolism is affected in these cases. The degree of value to the clinician is therefore proportional to the accuracy of our knowledge of the relation between the various internal secretions and the excretions. The most important work on this subject is that of Kendall,⁴ which is discussed very fully by Larson,⁵ from the point of view of physiology rather than of clinical pathology. Kendall showed that 1 mgrm. thyrotoxin will increase the basal metabolism rate 2 per cent in an average adult—not in virtue of the iodine (on which so much stress has hitherto been laid), but in virtue of containing an imino group. Ambard's constant is not of any service for diagnosis.⁶ Vignes⁷ emphasizes the close relation between thyroid and metabolism, and brings a direct connection between albuminuria and myxœdema. He has no suggestions of value for diagnosis. De Sajous⁸ sees in adrenalin a possible agent for rendering hæmoglobin an oxygen carrier, and refers to a low blood-sugar content as a sign of adrenal insufficiency.

Numerous investigations have been made in the search for a relation between endocrine insufficiency and the blood-count, but the references all fail to adduce minute details. The search for neutrophilia, or for lymphocytosis, or for colour index, shows a lack of appreciation of the subtlety of the secretions themselves. If the amount of hæmoglobin varies in different cases, and the resistance of the red cells shows no constancy, and the coagulation time is not appreciably altered (Pellacani⁹), the more recent researches present equally insignificant results. Kaufmann³ still takes it for granted that the presence of lymphocytosis must be attributable to thymus function, and associates this finding with asthenia, chronic dyspepsia, and a syndrome designable as status hypoplasticus. Port and Brunow¹⁰ found that adrenalin will cause a lymphocytosis and a fall in the eosinophils. Frey has interpreted this differently (*see* SPLEEN, FUNCTIONAL EFFICIENCY TESTS).

Korczynski¹¹ gives a careful study of the blood in cases of thyroid insufficiency. The red cells remain constant in number and resistance, but show great loss of hæmoglobin, and tendency to metachromatophilia. The neutrophils are much diminished, and the large mononuclears are increased; myeloblasts and irritation

cells are noticed. There is a tendency to eosinophilia. The connection between these changes and the thyroid is supported by the fact of their disappearance under suitable treatment.

The intimate relation between all these ductless glands and their relation to the sympathetic nervous system strongly militates against the formulation of a definite blood-picture, though there is no doubt of the value of such findings as above instanced for the corroboration of the other parts of the clinical symptom-complex. The disposition to ascribe every cryptogenic disorder to disease of this system, shown by Léopold-Lévi,¹² will be evaded, and the three types of disorder to be encountered in each member of the whole system (hypo-, hyper-, and dys-function) will be borne in mind.¹³

REFERENCES.—¹*Jour. Gen. Physiol.* 1919, i, 305-313; ²*Beit. z. klin. Chir.* 1913, lxxxiii, 3; ³*Mittteil. a. d. Grenzgeb. d. Med. u. Chir.* xxviii, Heft 2; ⁴*Endocrinology*, 1918, April; *Amer. Jour. Physiol.* 1919, xlix, 136; *Jour. Amer. Med. Assoc.* 1919, ii, 871; ⁵*Amer. Jour. Physiol.* 1919, xlix, 55-90; ⁶*Gaceta Med. de Caracas*, 1918, xxv, 187; ⁷*Progrès Méd.* 1919, 15; ⁸*Endocrinology*, 1918, ii, 258-282; ⁹*Rev. d. Psych.* 1912, 423 (rev. *Fol. Hæm.* xv, 22); ¹⁰*Arch. f. exp. Path. u. Pharmacol.* lxxvi, 239; ¹¹*Med. Klinik.* 1915, No. 31-32 (rev. *Fol. Hæm.* 1919, xix, 11); ¹²*Progrès Méd.* 1919, 247; ¹³*Ibid.* 114.

DYSENTERY, BACILLARY. (See also AMŒBIASIS.)

Sir Leonard Rogers, M.D., F.R.S.

ETIOLOGY AND DIFFERENTIAL DIAGNOSIS.—The stimulus given by the war to the study of dysenteries has resulted in further extensive additions to the literature of bacillary dysentery, dealing largely with the important practical question of the early recognition of this form, which it is now generally recognized has been much more prevalent in the various armies in the East than the amœbic form, with the possible exception of 1915 in Egypt, while P. Bahr and J. G. Willmore¹ record their reasons for differing from the conclusion of G. B. Bartlett (see MEDICAL ANNUAL, 1918, pp. 82-3) that the majority of the Gallipoli cases were amœbic.

G. J. Kliger and P. K. Olitsky² attribute the frequent failure to isolate dysentery bacilli to not directly plating as early as possible from pure blood and mucus, and to using wrong media, and they advise a modified Endo or a veal-infusion eosin-blue for the purpose, which should be neutral or only slightly alkaline. W. Whitehead and J. Kirkpatrick³ use either fresh specimens or those kept in ice, preferably obtained in the first day or two of the disease, and employ MacConkey's medium with double strength of neutral red; they obtained 75 per cent successes in typical blood and mucus stools, but only 2 out of 3000 purely fæcal stools, which it is useless to examine. G. S. Buchanan⁴ reports an acute outbreak of Shiga bacillary dysentery, with bacteriological verification, in the eastern counties of England, in which there was evidence of pollution of the well-water. The blood of the infected persons showed strong agglutination of the Shiga bacillus, and 1.8 per cent of unaffected people associated with them showed similar blood changes. R. Donalson, A. B. Clark, and R. C. McLean⁵ have studied 463 cases returned to a base hospital as dysentery, nearly all past the acute stage, and averaging 48.4 days since the onset of their illness. They obtained evidence of bacillary infection in only 14.4, and *Amœba histolytica* carriers in 10.15 per cent. They advise a minimum of three examinations for the bacilli and five for amœbæ. Out of 19 positive Shiga cases, 9, or 47.3 per cent, also showed the bacillus in their urine. In 23.3 per cent of the positive cases a double infection was detected. J. G. Thomson and L. F. Hirst⁶ discuss the types of dysentery bacilli isolated by them at Alexandria in acute cases. The first 100 strains comprised 29 typical Shiga, 32 Flexner, and 39 atypical. They lay stress on the great variability of the Flexner group, and the increasing evidence of the instability of some of the fermentation reactions. A. Ascoli⁷ comes to a similar conclusion.

J. G. Willmore and C. H. Shearman⁸ urge the danger of relying on the slow and uncertain bacteriological examination of dysenteric stools in the diagnosis of acute dysentery, the immediate correct treatment of which is of such vital importance to the patient. During the first quarter of 1917, among 3094 with typical blood and mucus examined bacteriologically under optimum conditions in military laboratories, dysentery bacilli, including atypical forms, were only detected in 15·3 per cent, though there is good evidence to show that the great majority were bacillary in nature. On the other hand, they maintain (in confirmation of Graham as recorded in the MEDICAL ANNUAL of 1919) that by paying attention to the characters of the predominating cells in the mucus, as seen by a simple microscopical examination, much more reliable and rapid diagnostic results may be obtained, apart from the presence or absence of the specific *Amœba histolytica*. After discussing the pathological processes in the two types of dysentery, they describe the cytological changes found in bacillary dysentery—an abundance of cellular exudate, mostly polynuclear, toxic necrosis of the cells, including the nucleus, producing the 'ghost-cell', being evidence of intense inflammatory reaction to microbic infection. In amœbic infection, however, cells are few and their nuclei are well stained, although the cytoplasm is often extensively digested away. Thomson and Hirst⁹ also lay stress on the presence of numerous, often degenerated, polynuclear leucocytes, as well as columnar epithelial cells, in mucus, as diagnostic of bacillary dysentery, and think that amœbæ are seldom overlooked by competent observers.

G. Marshall Findlay⁹ discusses the diagnostic value of the blood changes in dysenteries, and considers that if 60 to 80 per cent of the polynuclear leucocytes show a well-marked glyco-genic reaction on mounting blood-films, in which the leucocytes have been allowed fifteen minutes at blood heat in a plasticine cell to escape from the blood-clot on to the coverglass and slide, followed by treatment with 1 per cent watery iodine solution, and nuclear pseudopodia are absent, the disease will be bacillary in 90 per cent of the examinations. On the other hand, numerous nuclear pseudopodia are suggestive of amœbic disease.

A. Loeffler¹⁰ describes a severe Shiga bacillary epidemic traced to the consumption of a potato salad, with 378 cases, being 27·6 per cent of those who ate it. The mortality was 8 per cent.

L. S. Dudgeon¹¹ states that dysentery bacilli die out very rapidly from acid fæcal stools, but the addition of 3 per cent normal sodium hydrate in equal volume to dysentery stools increased the positive results when any delay occurred in examining them. A Shiga agglutination of 1 in 40 was diagnostic, and 1 in 25 strongly suggestive, being especially valuable in febrile cases. Infection might occur through water, and flies played an important rôle in its spread.

A detailed scheme for dealing with dysentery carriers has been published by the Army Council.¹²

TREATMENT.—P. L. Lantin¹³ records a small series of cases treated with **Antidysenteric Serum**, chiefly intramuscularly, with good results. G. Schreiber¹⁴ advises large doses of 20 to 50 c.c., or more, of serum, gradually increased up to 100 c.c. Vaccines have been used prophylactically and curatively. Variable reports have appeared on the value of Boehnche's vaccine, which Boehnche and Elkeles,¹⁵ on the basis of 100,000 inoculated, claim to produce protection for at least three months, and to diminish the severity and death-rate of the disease. Hoffmann¹⁶ reports its failure to prevent dysentery in persons inoculated three times. Gross¹⁷ concluded that the vaccine had little use in severe cases with general intoxication, in which serum alone availed, but had a very good effect in mild cases without constitutional disturbance. Ballmann,¹⁸ in addition to using serum in toxic cases, gave a rectal injection of 1 to 2 litres

of 1 per cent Tannic Acid, to be retained if possible for twenty to thirty minutes, and found it to check the tenesmus in a few minutes, and to free the stools from blood and mucus by the next day.

REFERENCES.—¹*Quart. Jour. Med.* 1918, July, 349; ²*Jour. Amer. Med. Assoc.* 1918, Dec. 28, 2126; ³*Lancet*, 1918, ii, 143; ⁴*Ibid.* 166; ⁵*Pract.* 1918, July, 1; ⁶*Lancet*, 1918, ii, 448; ⁷*Presse Méd.* 1918, July 11, 357; ⁸*Lancet*, 1918, ii, 200; ⁹*Ibid.* 1919, i, 135; ¹⁰*Zeits. f. Hyg. u. Infektionskrank.* 1918, lxxxvii, 410; ¹¹*Lancet*, 1919, i, 673; ¹²*Ibid.* 626; ¹³*Philippine Jour. Med. Sci.* 1918, Sept., 26; ¹⁴*Paris Méd.* 1919, i, 55; ¹⁵*Zeits. f. Med.-Beamte*, Berlin, 1918, xxxi, 209; ¹⁶*Deut. Mil.-Arzt.*, Berlin, 1918, xlvii, 233; ¹⁷*Deut. med. Woch.* 1918, xlv, 796; ¹⁸*Munch. med. Woch.* 1918, lxxv, 1238.

DYSIDROSIS. (See POMPHOLYX.)

DYSPHAGIA DUE TO ŒSOPHAGEAL SPASM. (See ŒSOPHAGUS.)

EAR DISEASE. (See also DEAFNESS; VESTIBULAR APPARATUS IN RELATION TO NEUROLOGY.) *John S. Fraser, M.B., F.R.C.S.*

OTITIS MEDIA PURULENTA ACUTA.

Aural Complications of Influenza.—Hill¹ states that in the recent epidemic of influenza, otitis media was not a very frequent complication. Out of a series of 6870 cases of influenza there were only 120 cases of acute suppurative otitis media. There were 1600 cases of pneumonia in this series, and 66 of the cases of otitis media occurred among these. Of the 120 cases, 17 were bilateral; 21 cases developed mastoiditis; one patient developed otitic meningitis, and died. In practically every case the type ran true to form. The onset was quite sudden, generally occurring on from the first to the third day of the disease. The first symptoms were intense earache, with, or sometimes preceded by, a feeling of fullness. Hill attributed the headache and malaise to the general effect of the influenza, and the temperature, which ran from 101° to 104°, must be considered in the same way. (Otitis media in non-influenzal cases ran a normal temperature.) Otoscopic examination within two or three hours after the onset of pain showed vesicles on the membrana tympani. In almost every case there was marked redness and some bulging of Shrapnell's membrane (*sic*). The superior posterior quadrant of the drumhead showed the greatest change, and there was frequently a large hæmorrhagic bleb bulging outward. Often there were two or three of these blebs, always superior, either anteriorly or posteriorly, and often extending to the wall of the external auditory meatus. There was no tenderness over the mastoid process at this stage. Incision of the blebs evacuated a small amount of bloody serum. In the older cases this could be expressed from the vesicles only with some effort, as if clotting or organization was taking place. Incision of the membrana tympani in the earlier cases was followed by considerable bleeding. Later, this became a profuse, sero-sanguineous discharge. In one case the bleb became a pedunculated sac, of considerable length, but with narrow pedicle. This was removed, and gave the microscopic appearance of mucous membrane. Pain generally subsided about two hours after the incision. The sero-sanguineous discharge continued profusely for several days, and then gradually changed to a thin purulent discharge which later became of thicker consistency. Nose and throat examination showed congestion of the mucous membrane, with purulent secretion and acute pharyngitis. Epistaxis was a fairly frequent incident.

In some cases, in from ten to twelve days from the onset the whole superior canal wall would become flattened. Usually there was no mastoid tenderness or œdema. Hitherto the flattened superior canal wall has been considered one of the most reliable signs of a suppurative mastoiditis, and frequently an indication for operation. Hill found the reverse to be true by clinical observa-

tion, x-ray examination, and also by operation. Cultures upon blood agar showed the streptococcus (hæmolyticus) in practically every case. Occasionally an admixture of staphylococci was also found.

Even after the membrana tympani had regained an almost normal appearance and colour, a certain percentage had increase in the discharge, with thickening of the mastoid periosteum, slight tenderness, and œdema over the tip. Of the 21 cases which came to mastoid operation, one showed a normal mastoid, two simply a congestion of the mucous membrane of the cells. The rest showed a hæmorrhagic cortex and more or less free pus. The bone was not broken down. One of the patients with erosion of the tegmen developed leptomeningitis and died. This case was complicated by a severe pneumonic process involving both lungs. Many cases which showed a flattened superior canal wall and a cloudy x-ray of the mastoid cleared up without operation.

Acute Affections of the Middle Ear following Measles.—Harris² states that, of 1685 ear cases treated in a military hospital, 607 were cases of measles. The symptomatology of the cases of otitis media acuta occurring in measles was strikingly characteristic, and differed entirely from the ordinary classical picture of acute purulent otitis media of non-zymotic origin met with in civil life. The patient, more or less toxic, with elevation of temperature, pronounced leucocytosis, and racked with cough, would be found lying entirely free from all complaint or pain as far as the ear was concerned. In fact, in a great majority of these cases, the ear complication was discovered only in the course of a routine examination of the ears. At the most, the patient would admit upon direct question that there was a feeling of stuffiness in the ear. The examination of the ear would show no characteristic picture. Usually the landmarks were obliterated, and there was a boggy appearance of the drum membrane. If seen extremely early there might be a slight injection in the handle of the malleus and Shrapnell's membrane. At a variable time after the onset, bulging of the drumhead took place in the posterior upper quadrant. To wait for this to occur was almost certain to mean mastoiditis and operation. It was therefore the rule to open the drum freely immediately upon discovery of any change in its appearance. Often the incision was followed by a mucopurulent discharge. If the incision was made early enough, if the infection was not too virulent, and if unceasing vigil had been exercised in maintaining free drainage by repeated paracenteses, the case would gradually go on to convalescence and recovery. If, on the contrary, free drainage had not been maintained, if the organism present, usually a streptococcus or pneumococcus, was exceedingly virulent, and finally, if the patient's resisting power had been too much lowered, the inevitable course was toward an extension of the process from the attic to the antrum and the mastoid cells. Acute mastoiditis was, as a rule, just as free from pain as was otitis media. It was almost impossible to believe that a patient could have a mastoid full of pus, and yet insist that he was not suffering and scarcely admit any tenderness on pressure, either over the antrum or over the tip. The only sign that could be depended on was a change in the upper posterior wall of the canal. In several cases an extensive destruction of the drum membrane took place, due to the virulence of the organism present. Operation was wont to disclose extensive changes in the mastoid cells. If the operation had been performed early enough, the progress to recovery, while usually unduly slow, was uneventful. If delayed, it was common to meet with epidural abscess, sinus thrombosis, brain abscess, or meningitis.

In place of ether or chloroform as a general anæsthetic, Harris used **Nitrous Oxide Gas and Oxygen**. Thirty-one cases of mastoiditis complicated by measles were anæsthetized, and of these ten had bronchopneumonia at the time of the

operation and one had mumps. The shortest time of administration was forty minutes, and the longest three hours and forty-five minutes. The average time was one hour and fifteen minutes. There were no untoward symptoms during the anæsthesia, or complications due to anæsthesia. All patients were conscious before the dressing was completed.

Harris recommends that every ward surgeon should be capable of making a satisfactory otoscopic examination. Further, he insists on the importance of **Prophylaxis** to prevent such infections from developing. Improved sanitary procedures, in addition to local treatment of the upper respiratory tract, are distinctly indicated. For disinfection, Harris has been using a 2 per cent solution of **Dichloramine-T**.

Paracentesis in Acute Otitis.—R. Lake³ has found that after the usual vertical incision far too many cases went on to mastoiditis and subsequent operation. The number of fulminating cases did not seem to justify the proportion of failures. Naturally the drum is not very elastic; an incision causes no gaping wound. The edges of incisions in the drum adhere and heal with extreme rapidity. The incision which Lake has adopted for the last few years seems to give better results, provided that one employs a general anæsthetic and that the case is seen before there is any mastoid involvement. Lake makes a

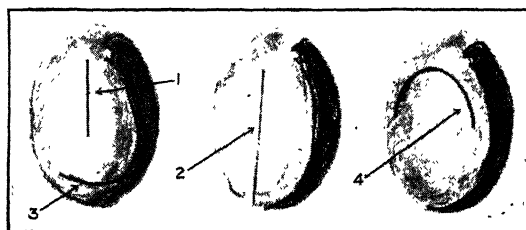


Fig. 6.—Incision of the tympanic membrane. 1. Usual vertical incision. 2. Long vertical incision employed by author until recently. 3. Curved incision employed in addition to (2) where the tympanic cavity contained much thick mucus. 4. Curved incision with convexity upwards now recommended by author. (*Lancet*).

crescentic or curved incision following the contour of the edge, and of about the same extent as the posterior superior quadrant, i.e., a curved incision with the convexity upwards (*Fig. 6*). This should allow of a longer drainage, for the flap tends to fall downwards. A straight-handed knife is the only shape that enables one to make a curved incision. As regards after-treatment, Lake recommends the trial of a combination of equal parts of 10 vol. **Hydrogen Peroxide** and **Liquor Sodæ Chlorinatæ**, mixed immediately before use, and instilled or syringed into the external meatus *while effervescent*.

Vaccine Treatment of Otitis Media.—T. Tanaka⁴ reports good results from **Autogenous Vaccines** made from secretions from the ear, or even from the nose if the ear is not discharging. The treatment is effectual in the acute phase, or as the otitis is just passing into the chronic stage. The vaccine therapy is peculiarly effective in otitis media in infants, and the author emphasizes the importance of curing the disease in this early stage, as there is no doubt that otitis media in adults is often the result of infectious processes in childhood. Under the vaccine treatment it is stated that the severe pain of otitis media in infants abates, and the pathological process is arrested. The author says that the importance of this is evident if we realize that the staphylococcus, the germ usually involved after the process has persisted for any length of time, is

particularly destructive of bone tissue. Ordinary symptomatic treatment does not reach the remoter regions of the lesions, and the destructive process may continue in the depths without any clinical manifestations, while the effect of the vaccine is felt at all depths. The cure is complete under five or six injections, namely, in ten or twelve days; the discharge usually ceases in four or six days. He uses 0.3 mgrm. of bacteria per cubic centimetre of the physiological saline, heating this suspension to 30° C. for thirty minutes. After heating, phenol is added to make a 0.5 per cent solution. In acute cases the intervals are forty-eight hours; in chronic cases, two or three days. The initial injection dose is 0.1 or 0.15 c.c. for infants and 0.25 for adults, increasing the doses until 1 c.c. is reached, and then recommencing with the initial dose. Tanaka reports an apparently complete cure in 95 per cent of the acute cases in infants and in 75 per cent of the chronic cases.

OTITIS MEDIA PURULENTA CHRONICA.

Efficient Treatment of the Chronic Running Ear.—Experience has convinced W. Wilson⁵ of the futility of our previous methods of treating otorrhœa. He recommends the following routine: (1) All cases of otorrhœa are admitted to a hospital for treatment by an aural specialist with a trained nursing staff. (2) Routine treatment is given at least twice daily by a nurse specially trained for the work; in certain cases the patient remains in bed and cleans his own ear every fifteen minutes or so. All granulations or any other obstruction to free drainage are previously removed by the aural specialist. (3) If there is doubt as to retention of pus in the mastoid, the patient is kept in bed on a light diet; the temperature is taken every two hours, and blood examinations are made. Syringing is only allowed in special cases. In nearly every case under treatment, by mopping up discharge down to the drum and the insertion of antiseptic drops, the discharge diminishes until it entirely disappears or only a little mucus persists. (4) When the patient leaves hospital, he is given antiseptic drops for his own use and taught to clean his own ear down to the tympanic cavity. His medical adviser is requested to return him to the hospital in which he has been treated if any untoward symptoms occur. Wilson does not recollect a single patient requiring a mastoid operation after the routine treatment had once been commenced and properly continued. Chronic otorrhœa is not the dangerous condition commonly supposed, if efficiently treated. Wilson's experience is utterly against the contentions of those who have recently advocated almost routine drainage of the antrum, holding, as they do, that chronic otorrhœa is perpetuated by a chronic infection of the mastoid antrum. Conservation of the middle-ear structures is rightly replacing a haphazard scraping away of all the contents of the tympanum. The radical mastoid operation should not be performed as a routine—the indications are few.

Bismuth and Iodoform in the Treatment of Chronic Suppurative Otitis Media.—Stoker⁶ recommends the use of a Powder of Bismuth and Iodoform in the same proportions as in B.I.P.P. in certain cases of chronic ear suppuration. It is only in cases in which the suppuration is limited to the mucous membrane that cure may be hoped for by local conservative measures, but such cases are extremely common. Technique: (1) Establishment and maintenance of thorough drainage. In the generality of cases that is already present, very many 'chronic ears' presenting but a rim of membrane or even none at all. (2) Removal of crusts, dead epithelium, and all morbid material, with hydrogen peroxide. (3) Thorough cleansing of meatus and tympanum with spirit, applied on a wool-carrying applicator, and allowed to dry. (4) Covering the tympanum with B.I.P.P. The powder is blown in with a fine-pointed, slightly

curved, powder-blower through a large speculum. In cases with profuse suppuration Stoker has not found that more than three applications a week are necessary, and in milder cases a weekly application fulfils requirements. As the suppuration lessens, the need for frequent sittings diminishes. Long duration of the condition is no bar to success. Many of the patients successfully treated had suffered seven or eight years. The presence of a polypus need not always cause dismay; it is not conclusive evidence of bone disease; but its removal is necessary before thorough treatment can commence.

Treatment of Progressive Deafness following Chronic Hyperplastic Otitis Media.—Emerson⁷ holds that chronic secretory—exudative—catarrhal or hyperplastic otitis media is the result of early infections, usually the sequela of the infectious diseases and *la grippe*. These diseases leave a streptococcus focus which becomes chronic and is indefinitely subject to acute exacerbations, causing recurrent attacks of subacute catarrhal otitis media, and frequent attacks of what seem to be acute rhinitis; yet they are not fresh infections, but the lighting up of this chronic focus. Adenoids are potential factors in deafness only because the impaired drainage keeps up the chronic infection. In early cases we must try to get rid of the toxic focus by complete removal of adenoids and tonsils, drainage of infected nasal accessory sinuses, attention to the teeth, etc. Treatment is useless after arthritic changes in the ossicular articulations, or after auditory nerve degeneration has taken place.

Disability in Chronic Middle-ear Suppuration.—J. F. O'Malley⁸ has recorded a case in which the left ear had discharged constantly for over two years; no history of disease in childhood. "Pain for about eight months in bone behind ear, worse at night". O'Malley asks: (1) For the purpose of a pension award, is one justified in stating that this trouble began two years ago and not previously (see right ear)? (2) Assuming that he has been in the Army over two years, should his condition be attributed to (a) military service, or (b) only aggravated by it, or (c) not affected by it? (3) Is a radical mastoid operation positively indicated? (4) What is the surgical prognosis, apart from the function of hearing? In the discussion following the exhibition of this patient, Goldsmith said that the man had been in hospital a considerable time, and it was necessary to assume the idea that it was a psychic case. The patient knew he would be paid if his deafness was due to service, or if it had come on after the war commenced. He admitted that he had always sat in the front at the theatre. He got some water in his ears, and had a discharge without pain a few days later. That was the course of a case of ordinary chronic middle-ear suppuration (in which there was a perforation) lit up by the presence of water in the middle ear. Goldsmith therefore thought that the condition was aggravated by war service, and that it existed before the war. The pain he regarded as largely psychic. Dundas Grant said it was unfortunate that, from the nature of things, men had to be taken into the Army without being examined closely as to the condition of their ears. If that had been done, many in the Army would not have been there. We had to give the man the benefit of the doubt, and unless we felt very confident that the condition was an old-standing one, we were bound to accept the man's statement that his ears were well before enlistment. Dundas Grant agreed that the man had an old-standing condition which was re-awakened since he joined as the result of his exposure. He considered that 30 per cent would be fair disability allowance. Stuart-Low said that he had seen very many of these cases. If a man had discharge from the ear, he was put back to Grade 3. Stuart-Low did not doubt that the condition in this case had been chronic for years. Sharp held that the disability was certainly contracted in the Service, and as certainly aggravated by service. Sharp did not think it was attributable to military

service, and considered that the percentage for disability should be 15. O'Malley, in reply, stated that all agreed that the man had had disease in the ear prior to two years ago, and also that the condition had been aggravated by military service.

MASTOIDITIS.

Surgical Pathology of Mastoiditis.—J. C. Beck⁹ holds that cases of acute mastoiditis should be divided into two great classes: (1) Cell-route or confluent mastoiditis; (2) Vascular-route or osteophlebitic mastoiditis. In the former we find often an external fistula over the antrum or near the tip, with considerable infiltration of the periosteum. As soon as the thin cortex is removed, a fair quantity of pus escapes. The bleeding is usually very free. The intercellular septa are usually broken down. Not infrequently there is an exposed area of the lateral sinus, digastric fossa, or dura. In the vascular-route or osteophlebitic type, we find the mastoid cortex very little changed. There is only slight hæmorrhage. On opening the mastoid, however, the bone is very red and there is little or no pus. The cells are well preserved. Only in a later stage can one find any exposure of the lateral sinus, although it is this form of mastoiditis that has the greatest percentage of perisinus abscess and sinus thrombosis. The same is true of complications affecting the dura of the cerebrum or cerebellum, the labyrinth, facial canal, and digastric fossa.

In chronic mastoid disease Beck holds that we have an osteofibrosis, i.e., the mastoid is converted into more or less solid bone. If any cells are present, they are small and are located in or near the tip. There is frequently an exposure of the endosteum over the prominence of the horizontal canal, or of the dura mater over the tegmen. In many cases the cholesteatomatous changes can only be made out microscopically. These cases may be identified grossly (Bruehl test) by adding a few drops of chloroform, when the mass will turn a yellowish green (cholesterin). The cholesteatoma cavity varies in size, and may be located at the tip; or the external meatus, tympanum, attic, and antrum may all form one large cavity—the so-called spontaneous radical mastoid operation. Such cavities are due to pressure atrophy of the bone, plus necrosis due to the infection.

Local Anæsthesia in Mastoid Operations.—Orton¹⁰ states that children and excitable and timid persons should not be anæsthetized by this method. Further, if the area of operation does not permit satisfactory local anæsthesia, general narcosis should be preferred. Preparation of the patient: Morphine gr. $\frac{1}{4}$ to $\frac{1}{2}$, with gr. $\frac{1}{150}$ of atropine, is given one half hour before operation. The morphia is repeated at the time of operation. For local anæsthesia, Orton recommends a solution of 0.5 to 1 per cent Novocain, sterilized in a water-bath before each operation. In some of the cases a little adrenalin was also used. The Luer type of syringe, of 10-c.c. capacity, with straight needles, was employed. An assistant should be seated in front of the patient with his hand on the patient's pulse, so that he may give the operator at any time the volume and rate. Further, by talking to the patient the assistant will be able to keep his mind off what is going on. The skin is anæsthetized along the line of incision from above the auricle to one inch below the tip of the mastoid. At this point a deep injection is made to block off the auricularis magnus nerve. The occipitalis minor, which is about $1\frac{1}{2}$ in. posterior to the external canal and on a level with the floor of the canal, can easily be detected through pressure before injection, and must also be blocked. Then the needle is pushed in deeply through muscle and under the periosteum, along the posterior wall of the canal, and further injections are made. It is best to wait from five to ten minutes for the solution to take effect. The mastoid gouges can now be used

on the cortex with absolutely no pain to the patient; indeed, there is no pain until the mastoid antrum is reached. When the antrum is once located, the cavity is filled with the solution, which is allowed to remain while the operator works on the cells at the tip. [This method appears to apply only to operations for mastoiditis in acute otitis media, i.e., Schwartze operation.—J. S. F.]

The Reconstruction of the Mastoid Wound Cavity by Bone Grafts and Chips.—Two cases reported by Eagleton¹¹ demonstrate that, with a proper technique, the infection in the mastoid area can, in certain cases, be sufficiently eradicated to allow of the introduction of a **Bone Graft and Chips**, filling the cavity, with tight closure of the soft parts. This reconstructs the mastoid area, and also eliminates subsequent painful dressings, with the associated danger of secondary infection. After the primary (Schwartze) operation the wound is left widely open. The Carrel-Dakin method of wound sterilization is instituted, and, when the bacterial count shows a surgically sterile wound cavity, the skin and granulations are excised, the latter as far into the bone cavity as possible. One large bone graft from the tibia and many bone chips are placed in the cavity—enough to fill it. The wound is sutured in layers—periosteum, fascia, and skin. Upon discharge from hospital the patient has a flat mastoid area, almost imperceptible scar, and normal hearing. Eagleton appears to hold that his bone-graft method is better than the 'blood-clot'. He states that blood-clot, once infected, is a most favourable medium for the growth of bacteria. As the middle ear often remains septic after operation, the immediate infection of the blood-clot is so frequent that as a method of treatment of mastoid wounds it has been largely abandoned. During the war it was demonstrated that an infected wound can be converted into an aseptic wound, and then treated as a clean wound, closed, and primary union obtained.

J. J. Kyle¹² recommends the insertion of perforated **Rubber Tubes** after the Schwartze or radical operation. The cavity may be washed out with sterile saline or other solution twice daily.

B.I.P.P. in the After-treatment of Operations for Mastoiditis following Acute Otitis Media.—Herbert Tilley¹³ believes that in the use of B.I.P.P. (bismuth subnitrate 220 grm., iodoform 440 grm., and liquid paraffin 220 grm.) we have a means of greatly shortening the after-treatment in many cases of acute suppurative inflammation of the mastoid antrum and cells. The operation consists in removing the outer wall of the antrum and the cortical layer of the mastoid, then curetting away the infected mucous membrane of the antrum, followed by removal of all suppurating mastoid cells. The 'attic' and tympanic cavities are then irrigated with warm normal saline directed forwards through a cannula by way of the aditus. The bony wound is now thoroughly cleansed with swabs moistened in methylated spirit, dried, and *lightly smeared* with B.I.P.P., which should be of a creamy consistence. The external wound is sutured in its entire length, and a dry sterilized dressing firmly applied. The dressings and stitches are removed on the fourth or fifth day, and the line of incision is painted with collodion. In nearly every case Tilley found the wound securely healed without any inflammatory blush, and this even when the stitches had been inserted through thick, bacon-rind cedema. In three or four of the cases the line of incision was scarcely visible when the first dressing was removed. Tilley had no case of iodoform poisoning. The great advantage of the method is the saving of time in the after-treatment. Hitherto one was contented if a case of acute mastoid suppuration was completely cured within a month to five weeks. By the use of the B.I.P.P. compound we are able to discharge the patient from the hospital within ten days to a fortnight. Tilley admits that the procedure is only the blood-clot method over again, but holds that its security seems to be enhanced by the use of a suitable antiseptic.

Posterior Mastoiditis.—E. J. Moure and J. Rozier¹⁴ state that the abscesses which have been known under the generic title of 'Bezold's mastoiditis' may occur in certain special regions of the neck. Their formation and situation depend upon: (1) *The disposition of the posterior groups of mastoid cells.* These are postero-superior, posterior, and postero-inferior. (2) *The situation of the perforation of the mastoid abscess.* This may occur: (a) Posteriorly, through the canal for the mastoid emissary vein or through the temporo-occipital suture; or (b) Postero-inferiorly through either the mastoid apex or its internal surface into the digastric groove. (3) *The normal musculature of the neck.* Three important regions are the trapezosternomastoid, in the upper part of the posterior triangle of the neck; the retromaxillary, between the sternomastoid and the jaw; and the region of the great vessels, along the carotid sheath. Treatment consists in operating on the mastoid, and then tracing out the sinus from the interior of the mastoid to the neck; and, finally, opening the neck abscess. Except for a small drain in the antrum, the mastoid wound is closed; the neck wound is freely drained.

THE RADICAL MASTOID OPERATION AND ITS MODIFICATIONS.

Fraser and Garretson¹⁵ have published a paper based on an analysis of 306 cases of chronic middle-ear suppuration, as follows: radical mastoid operations, 238; modified radical mastoid operations, 17; labyrinthitis, 26; intracranial complications, 25.

Radical Mastoid Operations.—Of 238 cases, 191 were under thirty years of age. In only 66 cases did the patients or their relations remember the cause of the ear trouble, and of these, measles accounted for 26 and scarlet fever for 25. Although it is calculated that about 20 per cent of people would have any necessary major surgical operation done 'privately', only 9 of the 306 cases (3 per cent) were operated on as private patients. It would thus appear that chronic suppurative otitis media is not only absolutely but also relatively more common among the poorer sections of the community than among the more wealthy. The authors state that if cases of severe acute suppurative otitis media were properly treated when they arise—e.g., in fever hospitals—there would be very little chronic middle-ear suppuration, and consequently the radical mastoid operation would seldom be called for. Unfortunately Public Health Authorities have so far turned a deaf ear to the remonstrances of otologists in the matter. *Results:* 63 per cent of the cases reported. The main point brought out by examination of these was that the persistence of Eustachian catarrh or suppuration is the main source of failure after the radical mastoid operation. The radical operation does, however, free the patient from the danger of an intracranial complication. *Results in 110 non-skin-grafted cases:* 37 appeared to be cured, while 10 others were very satisfactory except that they showed want of care. This gives 43 per cent of cures. In 24 cases the inner wall of the cavity was moist. There was still some purulent discharge in 27 cases. In the remaining 12 cases the result was also unsatisfactory. Hearing after operation: improved, 35; the same, 36; worse, 22. *Results in 46 skin-grafted cases:* 20 appeared to be cured, and 12 others showed only want of care (70 per cent of cures). In the remaining 14 cases the result was unsatisfactory. Hearing after operation: improved, 12; as before operation, 16; worse, 6.

Modified Radical Operations.—17 cases. Hearing before operation: good, 10; moderate, 6; not tested, 1. The usual indication for the modified radical in preference to the radical operation was the retention of (1) good hearing in the operated ear, or (2) moderate hearing when the other ear was distinctly deaf. *Results:* Twelve of the 17 patients reported: 9 were satisfactory; in 3 cases

the cavity was still moist. Hearing after operation : improved, 10 ; as before operation, 1 ; worse, 1.

In the discussion which followed this paper, Mr. Arthur Cheatele stated that we were all aware of the loss of man power and money owing to ear troubles during the war. Pensions, therefore, would have to be paid for many years to come. On an examination of the ears of 1000 poor school-children, it was found that 88 of the children were suffering from chronic middle-ear suppuration. A report was sent to the Board of Education pointing out the large amount of preventable and curable ear disease among the children. With others, Cheatele had been examining candidates for commissions in the Royal Air Force. They had 35,000 through their hands : 5000 were rejected, of which about 5 per cent had chronic middle-ear suppuration. The antrum is most frequently and quickly involved in virulent infections, such as scarlet fever, measles, and influenza. If the acellular type of mastoid is present, the dense surrounding walls of the antrum preclude external perforation, and a chronic discharge from the antrum into the tympanum and meatus is established. The 'modified operation' is a bad and unscientific one in acute or subacute cases of mastoid suppuration. In chronic middle-ear suppuration it is inefficient.

Kerr Love holds that at the present time there is a tendency to operate on all cases of chronic middle-ear suppuration. During the last six years he has been treating school-children under the Glasgow School Authority. He always has under his care 500 cases of chronic middle-ear suppuration, and can count on recovery without operation in far more than one-half of these cases. He has adopted the modified mastoid operation for school-children more readily in the cases in which both ears are involved. He believes that operation has been unnecessarily done in many of the cases operated on by Fraser. Had all these cases been treated as Kerr Love now treats school-children, and at an early stage, most of them would have recovered without operation.

Charles J. Heath said that on his recommendation the Metropolitan Asylums Board had set up a hospital in London where all the children under their control who have running ears can be sent. If, after a few months' treatment, their ears have not ceased discharging, they usually do the conservative operation. He did not agree with Cheatele that conservative operations are undesirable in acute cases. He could not understand why people allow ears to continue running and do not risk an operation which is practically devoid of danger, and, if done early, is practically certain to arrest or prevent deafness.

William Hill thought that the old Schwartze operation was a good operation for acute and subacute cases : it is a conservative operation, and he believes it may be ample for the cases which Mr. Heath occasionally submits to the conservative operation. This operation is the Küster operation revived. After the Heath operation the posterior wall is gone and one can see into the antral cavity. The ear is thus exposed to cold draughts, and water may get into the ear.

Stuart-Low holds that chronic ear discharge in children undoubtedly originates in acute otitis media. The only sterling remedy is paracentesis tympani. The preventive treatment is the efficient removal of enlarged tonsils and adenoids. He never practised Mr. Heath's operation. All cases can be divided into two groups—those the cortical mastoid operation can cure, and those that it cannot, and upon such the radical operation should be done. Results as regards hearing after the radical operation have been exceedingly good.

Dundas Grant believes that it is quite exceptional for the patient not to get perfectly well after a Schwartze. He thought that grafts did not interfere with the hearing power.

Somerville Hastings has found that cases healed much more quickly after the modified radical than after the Schwartze operation; also the dressing appeared to be much more easy and satisfactory. For chronic cases he always performed the radical operation.

Ballance thought there was nothing better than the Schwartze operation for cases of acute otitis media with mastoiditis.

Fraser, in reply to the discussion, agreed with Cheatele that in cases of mastoiditis in acute otitis media one usually found the cellular type of bone. This was one of his great objections to performing the modified radical operation in cases of acute or subacute otitis media with mastoiditis. The tip of the mastoid process lies below the level of the external meatus, and consequently the operation cavity cannot be efficiently drained into the meatus. Through the incision made at the Schwartze operation, down to and past the tip, the whole of the diseased cellular structures in the mastoid process could be cleared out and efficient drainage secured. The only acute cases in which the conservative operation might be suitable would be those with a sclerotic mastoid process, in which there are no tip cells. In cases of chronic suppuration, on the other hand, the hearing was usually so poor that it was of little use to the patient, granted that the other ear was normal or almost normal. With poor hearing in the ear to be operated upon, it was not worth while to perform the modified or 'conservative' operation unless the hearing of the other was bad. Fraser agreed with Kerr Love that about 50 per cent of chronic cases were curable by conservative treatment without operation at all. It was necessary, however, for this treatment to be carried out by skilled nurses. Fraser was of opinion that until Mr. Heath published his results we would not get much further forward in this controversy. Until this time arrives we have only the unfavourable report of Plumer and Mosher regarding the end-results of Mr. Heath's conservative operation. We all wished to conserve or improve the hearing. On the other hand, we wanted if possible to cure the suppuration. What amount of hearing was really of use to the patient? If a patient had normal hearing in one ear, while in the other (ear to be operated on) he heard the conversation voice at 4 or 5 feet, he would not use the bad ear, but would depend entirely on the hearing in the good ear. Thus, unless the hearing in the ear to be operated upon was better than 'conversation voice at 4 feet', it was not worth while to do the modified radical operation, granted that the good ear was normal. On the other hand, if the hearing in the 'non-operation' ear was bad, then it was well worth while to do the modified operation. One could always perform the radical operation later if necessary. Fraser's findings at operation showed that the antrum was not the source of the pus in *all* cases of discharge from the middle ear.

Preservation of the Cholesteatoma Matrix at the Radical Mastoid Operation.—Dundas Grant¹⁶ has demonstrated two cases of radical mastoid operation in which he had left the cholesteatoma matrix. The cases were shown fourteen years and six months respectively after operation. O'Malley and Paterson, following Dr. Grant's suggestion, had also left the matrix behind and obtained good results. Dundas Grant thinks everyone is now agreed that the cholesteatomatous membrane is an attempt at dermatization, and is, as a rule, a very successful attempt. When it is complete it should be retained.

The Answer to the Opponents of the Radical Mastoid Operation.—Wesley C. Bowers¹⁷ states that men are doing the radical operation without knowing the indications for operating, without having learned the local anatomy, and without having acquired a technique. Loss of hearing, facial paralysis, failure to stop the discharge, death in several consecutive cases, give rise to confusion and distrust. The radical mastoid operation is not a simple one, either in its

technique or indications. It is not an operation for curing a chronic infection limited to the middle ear and Eustachian tube, except in very exceptional cases. It is for curing infection in the tympanic vault, or mastoid bone, or both. Many cases of chronic discharge from the middle ear can be cured by local treatment. In time, nature herself will cure, in some cases, by producing a picture very much like the cavity produced by the radical operation. It is, however, much more common for nature to destroy bone over the dura, sinus, or labyrinth, causing serious complications. If we can be sure that all the infection is limited to a certain part of the vault or mastoid, then a modification of the radical is justifiable. Such cases are but few. The modified operation has shown little, if any, better functional results than the radical, when the radical is properly done.

The number of persons who have good hearing in the infected ear after a prolonged middle-ear discharge is relatively small. When a patient hears mainly with the affected ear, it is not justifiable to do a radical, except in cases in which the symptoms are very ominous. Patients should be instructed in all the symptoms of danger. It is objected that the radical mastoid fails to stop the discharge. The chief causes of failure are: (1) Failure to so modify the bony meatus as to produce the best possible facilities for drainage and inspection of the middle ear. (2) Failure to clean out the various recesses of the middle ear perfectly; (a) The post-tympanic space (sinus tympani) is sometimes very deep, and generally lodges a considerable quantity of unhealthy granulations and serves as a pocket for the retention of secretion; (b) The floor of the middle ear, with the annulus tympanicus, is often very deep and serves as a pocket for secretion; (c) Omission to clean out the Eustachian tube thoroughly; (d) An inadequate flap cut from the fibro-cartilaginous meatus; (e) Omission to instruct patients in the proper after-treatment of the cavity.

We must endeavour to avoid any traumatism to the stapes. It is wiser to leave some granulations around this ossicle, provided they appear healthy, than to take too great a chance of injuring the membranes covering the windows. It is wise to make sure that the stapes is not bound down by adhesions and that it moves freely in its niche. Anything we can do to prevent the formation of dense fibrous tissue and adhesions around the windows will be likely to produce better hearing. The annulus tympanicus should be entirely removed by means of a curette; in doing this the jugular bulb is sometimes exposed in the floor of the middle ear. During the procedure of cleaning out the middle ear, time spent in the application of adrenalin is well employed, as much less sponging is thereby required. If the cells surrounding the tube are diseased, they are curetted, and the processus cochleariformis is removed. The tube should be made smooth and the mucous membrane removed as far as possible.

The carotid artery lies below and internal to the tube; there is very little danger of injuring this, even though it be exposed. Bowers turns up a meatal flap and dissects the cartilage and subcutaneous tissue from the skin flap. The flap is sutured to the subcutaneous tissue or periosteum in order to draw it well up. Before grafting, the wound is again packed firmly with adrenalin gauze. Bowers uses the primary skin graft, regardless of whether the dura or sinus is exposed, in all cases, except those in which (1) the dura is actually inflamed, (2) a fistula is present into a semicircular canal or other part of the labyrinth, (3) there is an unhealthy condition of the sinus wall, or (4) symptoms of labyrinthine or meningeal irritation are present. In some of these cases he uses the graft in the parts not under suspicion. Some of the grafted cavities are dry in two weeks, while others go two or three months before

they become dry. The time depends in part upon the patient's age and constitutional state.

Bowers reports on 112 cases operated and cared for by himself within the past two years: deaths, 0; complete facial paralysis, 0; partial facial paralysis, 1. From the 84 patients who reported, the following particulars were learned. Discharge: none, 63; considerable, 5; occasional, 16. Hearing: much better, 13; better, 38; same, 28; worse, 5. The bad results were mainly in his first nine cases.

The After-treatment of Radical Mastoid Cases.—G. Wilkinson,¹⁸ in the after-treatment of cases of radical mastoid operation, has been using a modification of the Carrel-Dakin 'Progressive Sterilization' method. This has given better results than any measure previously tried. He inserts a large, but not tightly-fitting, open rubber tube through the enlarged meatus. The retro-auricular wound is completely sutured. A single fold of aseptic gauze is carried round the pinna, but no dressing at all covers the meatal tube. The whole ear is covered by a perforated zinc shield, fixed in position by tapes tied round the head. The patient lies on the opposite side, and the nurse is instructed to run the Carrel-Dakin solution into the tube with a dropper every two hours. The shield is simply raised each time the wound is irrigated, and subsequently replaced. Wilkinson has also used *Acriflavine Solution* for irrigation. This also gives good results, but not quite so good as the Carrel-Dakin solution. The edges of the perforated zinc are covered by a split rubber drainage-tube. The shield is sterilized by boiling. The irrigation is kept up for a fortnight, at the end of which time the wound is sterile. The drain-tube is then removed. The further treatment consists in light packing of the meatus with a strip of bismuth gauze. At this stage the packing can be done quite painlessly. The shield is usually worn for six weeks to prevent infection of the wound from outside. As a rule the ear is almost dry at the end of six weeks.

COMPLICATIONS OF PURULENT OTITIS MEDIA.

Among 306 cases of chronic middle-ear suppuration operated on by Fraser¹⁹ during the last seven years, there were 26 cases of labyrinthitis and 25 of intracranial complication.

Twenty-six Labyrinth Cases.—Of these, 24 recovered and 2 died. Cholesteatoma was present in 13; granulations and polypi in 21 cases. In 3 cases there was an attic perforation, and in 2 a posterior marginal perforation. A subperiosteal abscess was present in 5, and facial paralysis before operation in 3. There was pain in the ear or head in 18 cases; fever in only 2; giddiness, 16; vomiting, 8.

Twenty-five Intracranial Complications.—Of these, 13 recovered and 12 died. The average age was nineteen years. Cholesteatoma was present in 18 of the 25 cases. *In most instances more than one intracranial complication was present.* Many of the cases were not sent in for several days, or even for one or two weeks, after grave symptoms had developed. For this reason it is not surprising that there is a considerable mortality associated with operations for the relief of intracranial lesions. Many general practitioners fail to realize the serious nature of symptoms arising as a result of middle-ear suppuration. They have now learnt to send in to hospital without delay cases of appendicitis, strangulated hernia, or ruptured gastric ulceration, but many of them still retain cases of suppurative otitis media associated with headache, vomiting, giddiness, rigors, etc., and treat them by means of sedative powders or counter-irritation.

Accidental Injury of the Sigmoid Sinus during Mastoidectomy.—Hunter Tod²⁰

states that theoretically accidental injuries of the sinus should not occur; nevertheless the majority of those who have performed a large number of mastoid operations have injured the sinus wall on more than one occasion. Fortunately subsequent septic infection rarely takes place. Injuries may be divided into two groups: (1) A clean cut through the wall of the sinus, with profuse hæmorrhage, necessitating obliteration of the lumen in order to arrest bleeding. In these cases Tod has never observed subsequent infection of the sinus. (2) Grazing of the outer layer or puncturing of the sinus wall.

Two types of mastoid process may be considered: (1) The easy type; usually in dolichocephalic skulls having mastoid cells, with the sigmoid sinus placed far back. In such cases the sinus can rarely be injured. (2) The difficult type; most frequent in brachiocephalic skulls. In these the mastoid process is composed of compact bone, and the sigmoid sinus is usually superficial, and protrudes over the outer wall of the antrum, which may be situated high up, almost under cover of the middle fossa of the skull. All of Tod's 6 cases were of this anatomical type; only 1 was fatal (thrombosis of superior petrosal and cavernous sinuses). In 5 of the six the jugular was ligatured. In the sixth case the sinus infection was very limited, and recovery resulted.

Tod concludes that: (1) Whenever the lateral sinus is exposed during the mastoid operation, careful inspection should be made. (2) If the sinus wall has been injured, the wisest procedure is to expose it freely and obliterate its lumen completely by means of gauze packing well beyond the affected area. (3) There may be no evidence of infection until about the tenth day after the mastoid operation, when a sudden rigor may be the first symptom. As a rule, for one or two days previous to this there is pyrexia with increased pulse-rate. (4) If hæmorrhage occurs from the mastoid wound a few days after the operation, the bone should be removed from the sinus wall above and below the affected area, and gauze plugging inserted, the sinus slit up and explored. Further surgical treatment depends on what is found. (5) The internal jugular vein should always be ligated in cases of septic infection of the sinus in which hæmorrhage has occurred.

Delirium following Mastoidectomy.—John A. Robinson²¹ reports a case of this condition and states that, although psychic disturbances rarely follow a mastoidectomy, they are quite common after gynæcological operations. The causative factors are usually said to be shock and traumatism.

Leucocytosis of the Spinal Fluid in the Diagnosis of Meningitis.—According to Perkins,²² the spinal fluid normally contains somewhat under 10 cells to the cubic millimetre, and these are lymphocytes, with perhaps an occasional endothelial cell. There should be no polymorphonuclears. A rather large number of diseases are capable of increasing the number and changing the character of these cells. Nevertheless, when, following a purulent middle-ear process, one has clinical evidence of, or has reason to suspect, meningeal involvement, the change in the kind and number of leucocytes of the fluid obtained by lumbar puncture, in conjunction with certain chemical tests, affords valuable evidence. If syphilis is excluded, one will seldom make a mistake in attributing the leucocytosis to the process complicating the otitis media. In the first stages of meningitis the cell count is low and mounts more or less rapidly, until, as death approaches, it may be well into the thousands. The polymorphonuclear percentage also increases to above 90 per cent in some instances. If, however, the process be circumscribed, the cell count does not mount so rapidly, unless the barrier adhesions give way. This fact accounts for some reported instances of death from meningitis, verified post mortem, with normal spinal fluid. If the inflammatory process is in immediate proximity to the cerebrospinal spaces, the latter may not be invaded by bacteria, though leucocytes may migrate

into the spinal fluid as they do into the tissues in the neighbourhood of any severe inflammation. This accounts for many of the cases of so-called serous meningitis which we observe. As the serum also finds its way into the cerebrospinal fluid, it is customary to find in these patients a positive serum-globulin test. Brain abscess, extradural abscess, sinus thrombosis, and labyrinthitis may all give rise to this condition.

Disturbances of Memory as a Result of Disease of the Ear.—Viktor Urbantschitsch²³ states that disturbances of memory occur not infrequently in diseases of the organ of hearing, especially of the middle ear. In certain cases they manifest themselves as general amnesia, but more commonly as loss or weakening of memory in one special direction, as in the case of names, figures, persons, places, music, speech, etc. The disturbances of memory last in isolated cases a fairly long time, but it is more common for them to occur only now and then and in varying degree. They are often dependent on the changing condition of the disease of the outer or middle ear, and pass away with the cessation of the ear trouble. Disturbances of memory may also be brought about by operations on the middle ear. How the memory may be influenced by ear conditions is shown by the influence of the ear on the central nervous system, as can be recognized in its motor, sensory, and psychical relationships. Of special importance is the reflex vasomotor effect of ear conditions on the blood-vessels of the brain, which is known to affect memory to a high degree. Experimentally one can prove, with the help of optic and acoustic memory pictures, that plugging of the outer and middle ear, as also pressure on the carotid, has an inhibitory effect on the memory. Urbantschitsch quotes the case of a very nervous female who could not remember her address. She asked for some amyl nitrite to smell. When a flush appeared on her face she at once became better and immediately gave her address. The patient could give very little information about herself for the last four months, except during the period when her peripheral vessels were dilated.

Otitic Meningitis.—Out of 19,000 cases of middle-ear suppuration analyzed by Dench,²⁴ 1 patient in every 88 suffered from some intracranial lesion. Dench has always looked upon serous meningitis as the first stage of diffuse suppurative meningitis. Cases of otitic meningitis may be divided into three groups—fulminating cases, regular cases, and latent cases. (1) In the fulminating cases there is very little difficulty in making a diagnosis. These very frequently are cases of what Dench has termed coincident meningitis—i.e., the patient has a pneumococcal meningitis and a pneumococcal otitis, but the former is not the result of the latter. Autopsy does not show any path of infection from the ear to the meninges. Cases of this fulminating type are occasionally seen when the meninges are injured at the time of the mastoid operation. (2) The regular cases also present absolutely no difficulties in diagnosis. When they appear as the result of invasion through the internal auditory meatus, we have symptoms due to the involvement of the internal ear. In such cases the direction of the nystagmus can be changed by shaking the head. (3) Latent meningitis chiefly follows operation upon the middle ear and mastoid. The first symptoms are general malaise, temperature from 99 to 101°, some headache (seldom severe), and vomiting. The vomiting is frequently considered to be due to the administration of the anæsthetic. We should always regard with suspicion any case of middle-ear suppuration operated upon where the vomiting persists longer than one would ordinarily expect. There may be some rigidity of the neck muscles. Kernig sign is doubtful, and patients do not seem to be very ill. This latent condition may persist for four to six days. The cerebrospinal fluid may be under pressure. The cell count is increased. This latent stage offers the best period for operation. The differential

blood count is of great value, since we often have a high polymorphonuclear count, 90 per cent, with a high white-cell count, 25,000. The first indication is to clear up the primary focus of infection. A large area of dura should always be exposed. Repeated lumbar punctures are also called for. Dench advises subsequent division of the dura if the symptoms persist. He has had no success with Haynes' operation, i.e., drainage of the cisterna magna. The Neumann operation, with incision of the dura at the internal auditory meatus, should be employed where invasion occurs through the labyrinth, but only in those cases. All efforts to treat cases by the intravenous or intraspinal injection of serum have been valueless. The same may be said of the use of urotropine in the spinal cord. Dench believes that we shall save a certain proportion if we insist upon operative interference in every case of otitic meningitis, except perhaps in fulminating cases seen very late.

Late Meningitis after Fracture of the Petrous Bone.—L. de Ruyter,²¹ states that the danger of a meningitis is much greater if suppuration in the ear has existed prior to fracture of the petrous. Ordinarily, the trauma causes a fracture of the tympanic ring and a tear in the tympanic membrane; here the path of infection is evident. Otitis is particularly apt to follow ill-advised treatment, such as lavage of, or instillations into, the ear. Wounding of the ring or tympanum is not essential, for infection may occur by way of the Eustachian tube. Two classes of delayed meningitis are to be noted: (1) The meningitis comes on early, but remains subacute for a time; (2) The meningitis ensues only after a considerable lapse of time. Klestadt details a case in which the patient succumbed 209 days after the accident.

Fraser²⁶ has reported two somewhat similar cases. In the first of these (*Plate IX*) the fracture passed through the internal meatus and vestibule, and the injury was followed by infection of the effused blood, with suppuration in the middle and inner ear, meningitis, and death four days after the accident. In the second case (*Plate X*) the patient—a child of six years—suffered from fracture of the base of the skull in August, 1913, but made a good recovery at the time. One year later the child suffered from double suppurative otitis media, and the infection passed through the tympanic cavity and gave rise to meningitis. The labyrinth was not involved, but microscopic examination of the ear showed that the incus had been dislocated and the roof of the mastoid antrum fractured (one year before). It is reasonable to suppose that the infection had passed to the meninges along this preformed path.

For a new method of employing *Nascent Iodine* in diseases of the ear (p. 9).

REFERENCES.—¹*Laryngoscope*, 1919, June, 351; ²*Ann. Otol.* 1919, March, 50; ³*Lancet*, 1919, i, 977; ⁴*Japan Med. World*, 1919, Jan., 867; ⁵*Brit. Med. Jour.* 1919, i, 648; ⁶*Lancet*, 1919, ii, 200; ⁷*Ann. Otol.* 1918, Dec., 1250; ⁸*Proc. Roy. Soc. Med. (Otol. Sect.)* 1918, Dec., 13; ⁹*Ann. Otol.* 1918, Sept., 869; ¹⁰*Ibid.* Dec., 1261; ¹¹*Laryngoscope*, 1919, May, 272; ¹²*Ibid.* Nov., 805; ¹³*Jour. Laryngol. Otol. and Rhinol.* 1919, March, 73; ¹⁴*Rev. de Laryngol. d'Otol. et de Rhinol.* 1918, March 15 and 31; ¹⁵*Proc. Roy. Soc. Med. (Otol. Sect.)*, 1919, April-May, 29; ¹⁶*Ibid.* 1918, Dec., 12; ¹⁷*Laryngoscope*, 1918, Nov., 790; ¹⁸*Jour. of Laryngol. Rhinol. and Otol.* 1919, Jan., 20; ¹⁹*Proc. Roy. Soc. Med. (Otol. Sect.)*, 1919, April-May, 29; ²⁰*Proc. Roy. Soc. Med. (Otol. Sect.)*, 1919, April-May, 62; ²¹*Ann. Otol.* 1919, March, 36; ²²*Ibid.* 1918, Sept., 974; ²³*Berl. klin. Woch.* 1917, 570; ²⁴*Laryngoscope*, 1918, July, 501; ²⁵*Rev. de Laryngol.*, etc. Paris, 1917, xxxix, 245; ²⁶*Proc. Roy. Soc. Med. (Otol. Sect.)*, 1919, Aug., 103.

ECLAMPSIA. For the use of Glucose as a disintoxicant (p. 7). Trans-duodenal lavage recommended (p. 9).

ECZEMA.

E. Graham Little, M.D., F.R.C.P.

Bryant¹ found unexpected relief following on the exposure of a case of itching eczema to the *Kromayer Lamp*, at a distance of 20 to 25 cm. and for periods of five to twenty minutes. Recurrences were not prevented, but symptomatic relief was very marked.

PLATE IX.

FRACTURE INVOLVING THE EAR

(J. S. FRASER)



Recent fracture of petrous bone and labyrinth, followed by meningitis and death.

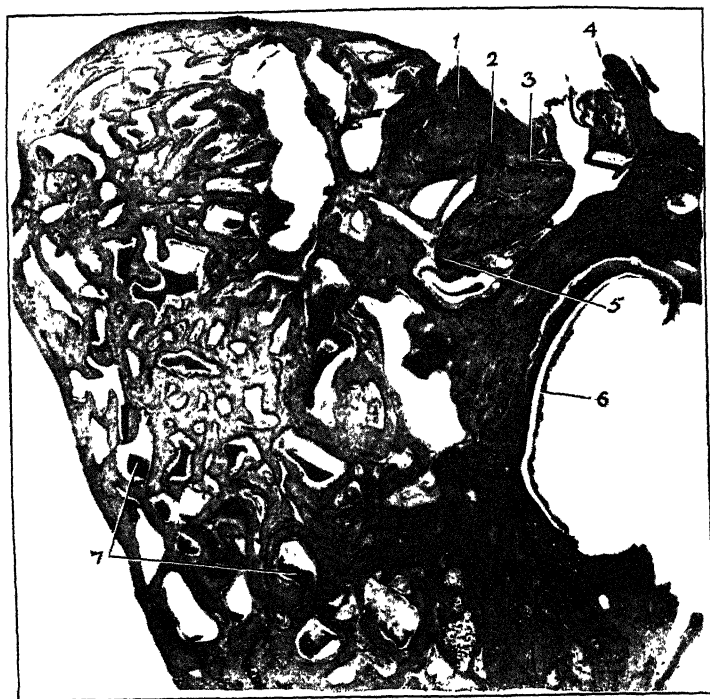
Vertical Section, $\times 6$. 1, Upper end of fracture, which passes into vestibule; 2, Hemorrhagic purulent exudate in vestibule; 3, Fracture through bony spiral lamina; 4, Exudate in scala tympani; 5, Lower end of fracture; 6, Hemorrhagic exudate in tympanic cavity; 7, Perforation of tympanic membrane; 8, Fracture of external meatus.

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PLATE X.

FRACTURE INVOLVING THE EAR—*continued*

(J. S. FRASER)



Old fracture of roof of mastoid antrum, followed one year later by acute middle-ear suppuration, meningitis, and death.

Vertical Section, $\times 6$. 1, Connective tissue in gap left by old fracture; 2, Long process of incus; 3, Articular surface of incus; 4, Outer edge of old fracture; 5, Tip of short process of incus which has remained attached to floor of aditus, while the rest of the bone became dislocated upwards and backwards into the antrum; 6, Epidermic lining of external meatus peeling off; 7, Exudate in air-cells behind labyrinth.

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Spurgen² contributes a note of a remarkable improvement effected in an extensive, and indeed nearly universal, case of weeping eczema, by **Rectal Injections of Saline**, with the addition of 1 oz. of brandy, following upon soap enemata. This treatment was repeated every other day, and the patient, who had sunk into a condition of extreme emaciation, illness, and fever, with Cheyne-Stokes respiration, recovered completely and rapidly.

Copper Sulphate is recommended in certain types (*p.* 6). **Margosic Acid** useful (*p.* 10).

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1918, Sept. 19, 394; ²*Brit. Med. Jour.* 1919, i, 636.

ECZEMA, ACUTE, IN CHILDREN. *Frederick Langmead, M.D., F.R.C.P.*

Louis Fischer¹ believes that eczema in children is closely related to gastric and gastro-intestinal derangements. It is more common in bottle-fed infants, but he has seen many cases in breast-fed infants brought about by imprudent diet on the part of the mother, which improved as soon as her diet was changed. Excessive eating of shell-fish and cereals; alcoholic beverages, and excessive quantities of sugar, add noxious substances to the milk, which prove to be irritants to the infant. Either chronic constipation or foul mucus-containing stools frequently precede eczema in the child. Excessive feeding with fat leads to vomiting and diarrhoea associated with intestinal fermentation, and the infant's failure to assimilate the fat leads to a kind of anaphylaxis. The fatty acids arising from undigested particles of food produce an intoxication to which he ascribes the eczema. A still commoner cause, in his opinion, is overfeeding with sugar, withdrawal of which leads to prompt improvement. Many patent foods especially rich in sugar give rise to eczema. Of other carbohydrates, cereals, particularly oatmeal, are also potent agents.

On these grounds he considers that local treatment is not sufficient, but that in every case the diet should receive attention. He favours the use of milk soured by the Bulgarian bacillus, and of vegetables in the form of spinach, peas, beans, sprouts, and cabbage. Plenty of water is recommended to assist in eliminating toxins, and **Saline Purgation**.

The treatment consists in eliminating from the diet rich foods which overtax digestion. When excessive fat, bacon, pork, butter, and carbohydrate foods are being given, their discontinuance modifies the eczema. Apart from reducing both the quality and quantity of food in such cases, the itching and excoriation are improved by giving a solution of Bicarbonate of Soda (3 gr. of the bicarbonate every hour by the mouth). To effect a cure he recommends continuing the diet for at least six to twelve months. [Although the nature of the relationship between eczema and the diet and gastro-intestinal state of infants is obscure, there can be little doubt that eczema in infants is something more than a purely local condition. Treatment of the skin, without correcting the diet and considering the general condition, is generally unsatisfactory.—F. L.]

REFERENCE.—¹*N. Y. Med. Jour.* 1918, ii, 804.

ECZEMATOID EPIDERMOMYCOSIS DUE TO A YEAST FUNGUS.

E. Graham Little, M.D., F.R.C.P.

Hudelo, Sartory, and Montlaur¹ report a remarkable case of a mycosis of the fingers, toes, groin, and perineal region, characterized by maceration and peeling of the epidermis and intense pruritus. Examination showed the condition to be caused by a *Saccharomyces*. It yielded readily to treatment by **Iodine** and **Chrysophanic Acid**.

REFERENCE.—¹*Bull. Acad. Méd. Paris*, 1918, 3 ser. 80, 360 (abstr. in *Med. Supp. Rev. Foreign Press*, 1919, Feb., 85).

ECZEMATOID EPIDERMOPHYTON INFECTION IN CHINA.

E. Graham Little, M.D., F.R.C.P.

Dold¹ demonstrates that a foot disease common in Shanghai and China generally, and known locally as 'Hongkong foot', is caused by a fungus which he identifies with the *Epidermophyton inguinale* of Sabouraud. It is interesting to note that his experience confirms our own, in the far greater incidence of the infection in men (81 of 98 cases dealt with), and the comparative immunity in young children, for in no instance was the disease met with under the age of eleven years. The demonstration of causation was complete, for Dold found the fungus, grew it, and reproduced the disease in his own person and in a native Chinese from the culture, and then again isolated the same fungus from the experimental cases. Cultures on proof media were similar to those described in the epidermophyton of Sabouraud. The clinical eruptions were of four types: (1) A vesicular type, accompanied by intense itching; (2) A chronic intertriginous type, with sodden white epithelium; (3) A chronic hyperkeratotic type, especially on the plantar surfaces; (4) A pyodermic type due to contamination by secondary infections. Repeated examination for the fungus may be necessary.

REFERENCE.—¹ *China Med. Jour.* 1919, March, xxiii, No. 2, 133.

EMPYEMA.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Till recently, experimental and operative work on the lung appeared to give discrepant results. Physiologists showed that opening the pleura caused dangerous pneumothorax. Surgeons, on the contrary, opened the chest with increasing confidence. E. Graham and R. Bell¹ have published most valuable experiments which tend to harmonize facts at first sight discordant. Their work establishes two theories put forward by Schrwald in 1889. First, that in the normal subject the mediastinum is so mobile, that pressure exerted in one pleural cavity compresses not only the homolateral but also the contralateral lung. The second theory is that the influence of an opening in the chest in causing lung compression and interference with respiration depends on the ratio of the area of the opening to that of the area of the glottis. These surgeons have shown that the maximal opening compatible with life (for a short period) in the normal adult has an area of about 8 square inches. If the opening into the chest is very large, air rushes into the pleural cavity so fast at each inspiration that full atmospheric pressure is exerted on both lungs *from the moment that inspiration commences* (see Schrwald's first theory, *supra*). If, however, the opening is relatively small, the air enters the pleural cavity slowly, and the patient by increasing the amplitude of his respirations has time to expand his lungs before atmospheric pressure can exert its full compressive force. Graham and Bell point out that, though wide operative openings are constantly made in the chest, these openings are often partly occluded soon after they are made, by the hands of the operator, by gauze pads, by instruments, or by delivery of the lung. Duval, in fact, recommends lung delivery as an expedient when, during intrathoracic manipulation, there is respiratory embarrassment. Gask and Wilkinson, at a British casualty clearing station, adopted the routine closure of all large openings into the pleura by temporary skin suture. This gave instant relief, and Anderson found that the benefit of closure outweighed the risk of infection.

In pleural cavities which have been subject to chronic inflammation, the mediastinum tends by losing its mobility to form a rigid partition dividing the chest, so that unilateral pneumothorax exerts no compressive influence on the contralateral lung. For this reason open pneumothorax is liable to be more dangerous in patients with acute infections (and even in healthy chests) than in those affected by chronic disease.

These facts explain the very high mortality reported from America after *early* operation on the empyemata complicating influenza. In these cases the pleural cavity was drained, an open pneumothorax was established, and both lungs were compressed. Since they were partly consolidated, increased respiration could not expand them sufficiently to compensate for their compression. The area of the openings actually made in the pleura was of course much less than the 8 square inches which in the normal adult chest is the maximal opening compatible with life. It must be remembered, however, that much more oxygen is required by patients with acute infections than by normal subjects, and that therefore an opening of much less than 8 square inches would be too large to permit of compensation. Further, the rate of respiration is so increased in these diseases that inspiration is too shallow to expand the lung against even slight compression.

The foregoing considerations form a touchstone for the merits of the various methods advocated in the treatment of empyemata. Ballin,² Legendre,³ and others find that, with influenza, empyemata which are due to the hæmolytic streptococcus occur in the first week of the disease. They should be treated if necessary by aspiration to relieve pressure. Rib-resection should invariably be postponed until after pneumonic symptoms have subsided.

Mozingo⁴ describes a 'Closed Method' for treating recent empyemata. Under local anæsthesia a trocar and cannula are introduced through a stab wound in the skin where the posterior axillary line cuts the 9th interspace. The trocar is withdrawn, and immediately replaced by a rubber tube which is passed through the cannula into the cavity. The cannula is then withdrawn, leaving the rubber tube *in situ*. The tube is transfixed by a safety-pin which is made to lie between gauze pads kept in position by strapping. The pus is aspirated with a syringe. Each time the syringe is filled, the tube is clipped to prevent air entering while the syringe is being removed and emptied. When all evacuable pus has been withdrawn, 20 to 60 c.c. of Dakin's Fluid are injected into the cavity. The process is repeated until the fluid returns clear. The cavity is then filled to half its original capacity with Dakin's fluid, and the tube is clamped for from five to thirty minutes, after which the fluid is withdrawn. The cavity should then be injected and aspirated once every two or three hours or, if there is pneumonia, every six or eight hours. At least once a day the cavity should be filled to three-fourths of its original capacity, to prevent the formation of small infected pockets. The action of the antiseptic is observed by taking daily cultures and smears. In about a week the pyogenic membrane will have dissolved, and the cavity should be 'fairly sterile'. About 10 c.c. of a 2 per cent solution of Formalin in glycerin is now injected once or twice in twenty-four hours. This usually causes some rise of temperature. The cavity often becomes sterile by the second or third day after the formalin treatment has begun.

Mozingo, Bérard, and Dunet⁵ allow the patient out of bed as early as possible after pneumonic symptoms have subsided: the thorax moves more freely, and the lung tends to expand better than it will in the recumbent posture.

R. A. Stoney⁶ publishes further good results of Carrel Treatment. In cases which are not cured by this treatment, there is probably a loculus which is not draining well, and which cannot be thoroughly washed out by the antiseptic fluid. For these cases separate drainage of the loculus may be required, or even thoracoplasty if the cavity is very irregular. A Carrel tube may sometimes be responsible for keeping up a mucoid discharge.

Garbat⁷ emphasizes the necessity for frequent bacteriological examinations during chemical sterilization of empyemic cavities, and notes the importance of using carefully standardized solutions. Although Carrel (Carrel and Dehelly,

Treatment of Infected Wounds) makes this standardization a *sine qua non* of success, many surgeons who think they are adopting Carrel treatment use solutions prepared with bleaching powder, which may contain too much chlorine, or none at all. Daufresne's method, quoted by Carrel, enables a solution of the right strength to be easily made.

Tuffier,⁸ dealing with cases where pneumonic symptoms had subsided, advises intercostal incision for pneumococcal empyemata, and resection of part of one rib for streptococcal and other infections. Using the method of chemical sterilization followed by suture, in 7 cases of non-traumatic empyema he found that the cavities became sterile in about one month. In 39 cases following wounds, sterilization required from fourteen days to six months. In 11 cases the wound had to be re-opened after suture for recurring empyema, and 2 cases were twice re-operated. The present tendency is to make the lung expand towards the thoracic wall. Tuffier remarks on the frequent difficulty of performing decortication. "If the false membrane of the pleuroparietal wall is not easily removed, it can be left behind without great harm resulting". If the decorticated surfaces ooze, a light gauze dressing is applied for twenty-four hours and 'waiting sutures' are inserted, which are tied when the gauze is removed. The deeper parts of the cortex covering the lung often remain infected after its free surface is sterilized, and Tuffier thinks that disappointment might be avoided by removing the membrane and continuing sterilization before closing the cavity. Bronchial fistulæ must be closed by 'enfouissement à la Lambert'.

H. Lilienthal⁹ describes a 'non-deforming' method of approach for performing decortication. Intraplaryngeal anæsthesia is used, ether being given through the nostril. An incision is made from the costal angle to the cartilage through the 6th or 7th interspace, and retraction gives an aperture 3 inches wide. This opening may be extended vertically at either end by dividing from one to four ribs: a 6-inch gap can thus be obtained. Insufflation of the lung with a bellows through the nasal tube during incision of the covering membrane aids in finding the plane of cleavage for decortication. The cut ribs are not sutured. After the lung has expanded, their ends remain apart.

Bérard and Dunet¹⁰ show that the classical site of drainage, at the point where the posterior axillary line cuts the 8th or 9th interspace, while excellent for recumbent patients, is not at the lowest part of the cavity when the body is vertical. The lowest point then usually lies more anteriorly, and is found by passing a curved blunt-nosed forceps through the first opening, and making its point travel in the gutter formed by the costo-diaphragmatic sinus until it begins to go up-hill. An intercostal incision is made at this point. The authors dwell on the necessity of cleansing the costodiaphragmatic gutter before inserting Carrel tubes.

Chevrier¹¹ finds that owing to œdema of the extrapleural tissue the level of the reflection of the pleura from the diaphragm to the ribs is raised in chronic empyemata. Ignorance of this fact, and the reliance on normal surface-markings, have led to the abdomen being opened instead of the pleural cavity. (Normally, in the erect posture, the lowest point lies in the 11th interspace 11 cm. from the middle line.) In order to tap the exudate at the lowest point possible, he explores the chest under radioscopic control from below upwards, in the line of the angles of the ribs, with a fine needle attached to a syringe, and makes a small intercostal incision just above the point of entry of the needle. A finger passed through this incision finds the lowest point of the cavity. A second incision is made to establish drainage at this point which, in the recumbent position, is the lowest.

According to Moorhead,¹² the aphorism that all cases of unresolved pneu-

monia are cases of undiagnosed empyemata is one that should be universally taught. After a period of acute illness, the temperature comes down to a lower level, but continues above normal until the empyema is dealt with. Accompanying the pyrexia there are often general prostration and frequent sweats, the importance of which from a diagnostic point of view may be overlooked, as they appear to be merely a continuance of the similar sweats so common in the earlier stages of influenza. The real difficulty in diagnosis is the interpretation of the physical signs. In ordinary empyema a more or less horizontal line of dullness, with diminished breath-sounds and vocal fremitus, is found, and on these signs the student is told to rely. In the post-pneumonic empyema, however, the signs are very different. In the first place, the upper level of dullness may accurately correspond to the line of division between the upper and lower pulmonary lobes, owing to the fact that adhesions limit the collection of pus to the lobe or part of a lobe that has been consolidated. In the second place, loud tubular breathing and even crepitus may be heard through a large collection of pus. This is presumably due to the fact that complete resolution of the lung does not occur as long as the overlying empyema persists. This persistence of tubular breathing, often amphoric in character, is quite compatible with the presence of pleural fluid.

In basal empyema the rectus muscle of the abdomen may be rigid on the side involved; and in two cases seen by Ingraham, pain and tenderness were first localized at McBurney's point. "Every practitioner should carry an exploring needle and syringe in his bag".

H. Brooks and R. Cecil,¹³ in a study of 80 cases, found sweating one of the most constant and suggestive signs of post-pneumonic empyema. The entire surface of the body, but especially the head and neck, is beaded with large drops. The sweats are unaccompanied by chill. These writers feel they have unlearned many physical signs of pleural effusion. All observers have been struck by the frequency of typical skodaic resonance in areas where aspiration gave abundant fluid, and where transmission of abdominal tympany could be excluded. Post-mortem study and radiography suggest that this sign is due to the presence of unconsolidated lung compressed by the fluid which covers it. A high-pitched percussion note is a sufficient indication for a tapping in these cases. Transient signs of pneumothorax appear occasionally: they are probably due to the rupture of minute pulmonary abscesses.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1918, Dec., 839; ²*Jour. Amer. Med. Assoc.* 1919, i, 335; ³*Presse Méd.* 1919, Jan. 16, 22; ⁴*Jour. Amer. Med. Assoc.* 1918, Dec. 21, 2062; ⁵*Presse Méd.* 1919, April 3, 169; ⁶*Med. Press and Circ.* 1916, April 16, 293; ⁷*Jour. Amer. Med. Assoc.* 1919, Feb. 1, 330; ⁸*Presse Méd.* 1918, Sept. 26; ⁹*Ann. Surg.* 1919, July, 43; ¹⁰*Presse Méd.* 1919, April 3, 169; ¹¹*Ibid.* Jan. 9, 9; ¹²*Med. Press and Circ.* 1918, Dec., 476; ¹³*Arch. Internal Med.* 1918, Sept., 269.

ENCEPHALITIS, LETHARGIC.

J. Ramsay Hunt, M.D.

During the past year many studies have been made of the curious cerebral affection which was termed lethargic encephalitis by von Economa, of Vienna. The clinical picture has been fairly uniform in the various countries in which epidemics have occurred. The pathology is that of hæmorrhagic encephalitis, which is localized in the brain-stem, sometimes the basal ganglia, and rarely the cerebral cortex. No constant bacteriological findings have been reported, although the disease has been transmitted to monkeys and appears to be associated with a filterable virus.

A small epidemic of the disease (16 cases) was first reported in England by A. J. Hall.¹ The cases included persons of each decade up to seventy years; only two were under ten. The sexes were about equally represented. The epidemic began early in March, and was practically over by the end of

April, 1918. The clinical picture, as a whole, was one of curious immobility. The attitude in bed suggests an effigy on a tomb; the immobile head and face a mask. This mask-like appearance is increased where there is facial diplegia, but a definite palsy is not necessary to produce it. One or even two of the three cardinal signs may be slight or absent.

Prodromal Period.—In most cases there is a distinct interval between onset of illness and appearance of characteristic symptoms. This varies rather widely. The onset of the cardinal signs may be sudden, but it is usually ingravescent. This is particularly true of the cranial palsies. They take some time to develop fully, and may vary in amount and extent from day to day. The general asthenia tends to make the facial palsies less obvious than usual.

Ophthalmoplegias.—Strabismus of variable extent, inequality of pupils, and nystagmus were commonly present. The last-named was sometimes of an irregular inco-ordinate kind.

Lethargy.—This was, perhaps, the most striking feature. It was not true sleep. Often the patient was surprisingly awake to what was going on. Many patients, stuporose all day, became delirious at night, returning to stupor next day. Sometimes the delirium was of a foolish kind, and suggested hysteria.

Speech.—During the lethargic period this was often affected. The words were imperfectly muttered, as though it were too much trouble to speak at all. In one case there was a distinct hurried or festinating speech, such as is sometimes observed in cases of paralysis agitans.

Claude² records a case which differs somewhat from those cases previously published under the diagnosis of lethargic encephalitis in the complete absence of ocular disturbances and the presence of a series of mental symptoms. The dominating feature of the conditions was the narcoleptic state, which gradually disappeared as the temperature fell. In convalescence there was a confusional syndrome characterized by cerebral torpor, slowness of ideation, apathy, and amnesia. The delay in normal mental activity for some time presented a striking contrast to an intermittent and transient oneiric activity and a pronounced loss of orientation. The condition showed a close resemblance to the confusional states of toxi-infective origin.

The *pathology* has been investigated by Marinesco and Mott³ in two cases. Disseminated miliaary or punctiform hæmorrhages visible to the naked eye existed in the grey matter in the neighbourhood of the floor of the ventricle, the aqueduct of Sylvius, and even the third ventricle, and were also found in the posterior part of the pons and peduncles. The cerebral cortex, except for congestion of some of the vessels of the leptomeninges, had shown in these two cases neither macroscopic nor microscopic lesions. On the other hand, the first segment of the spinal cord, which was the portion of the cord available, had presented the same histological lesions as the pons, bulb, and peduncles. Microscopical study of the above-mentioned regions had demonstrated the existence of four kinds of lesions: (1) Infiltration of the walls of the small vessels, and especially the veins, consisting of lymphocytes and plasma cells in the adventitia, disposed in several layers. The endothelium and fibroblasts might also take part in the inflammatory process. (2) Foci of interstitial inflammation, consisting of neuroglia cells of several kinds, including large cells with voluminous excentric nucleus, and many fibrillar prolongations, lymphocytes, and polynuclears. The foci of interstitial inflammation appeared sometimes to be altogether independent of vascular infiltrations, and might occur in the roots of the nerves—e.g., hypoglossal, pneumogastric, etc. (3) Lesions of the nerve cells, which did not correspond with those usually seen in infantile paralysis. There was dissolution of the *soi-disant* Nissl bodies, relative achromatosis, reduction in volume of the cellular body and of the

number of prolongations and multiplications of the satellite cells, but only exceptionally was there evidence of neuronphagia as described by Economo. (4) The foci of hæmorrhage, the most obvious microscopic change, were seen to be much more numerous when microscopic examination was made. These hæmorrhagic foci remain circumscribed around the walls of the small vessels, and red corpuscles were mingled with the cells of inflammatory infiltration, or they constituted a kind of covering and floated around the vessels. Marinesco regards lethargic encephalitis as a disease entirely different from botulism, from the hæmorrhagic polio-encephalitis of Wernicke, from the poliomyelitis of Heine-Medin, and from sleeping sickness. Like these two last diseases it was an infectious inflammatory disease, but the nature of the infection germs had not yet been determined. It was distinguished from botulism by its symptomatology and by the four above-mentioned histological lesions. The vascular lesions, due to the presence of an infiltration of the walls of the vessels by migratory elements, were absent in botulism, and the readily recognized *B. botulinus* had not been found in these cases.

Observations on Blood Counts and Cerebrospinal Fluid.—In cases observed by P. N. Panton,⁴ the average leucocyte count was 7600 per c.mm., and the relative proportion of the cells was about normal. An occasional somewhat higher leucocyte count was explained by the presence of a septic rash or some other complication. The spinal fluid was in all cases clear and without any coagulum on standing, such as was found in tuberculous cases. The protein was never more than slightly increased, and the cellular content was either normal or slightly increased also, the type of cell being always lymphoid. In some cases he thought that the protein excess—which, though not great, was constant—was greater than should have been expected from the small number of lymphocytes found. Although these changes were very slight, they appeared to be constant. The value of leucocytic, and in particular of spinal fluid, examinations as a means of *excluding* diagnoses was abundantly manifest.

The Report of the Local Government Board is summarized by S. P. James.⁵ In its initial stages the inquiry was concerned chiefly with an investigation of botulism. The result of the preliminary investigations was that neither on the bacteriological nor on the epidemiological side could any direct or indirect evidence be obtained of an association of the illness with the *B. botulinus* or with infection from food. It was found that from infantile paralysis the present illness differed very strikingly, not only in the localization of the paralysis and some other equally obvious signs, but in its age coincidence, seasonal prevalence, course, duration, and fatality.

Results of Investigations.—(1) For identification and description it was decided to follow von Economo in terming the illness encephalitis lethargica, a name which had the right of priority and indicated a characteristic clinical feature. (2) In its essential primary features the illness had a characteristic and constant symptom series of its own; and between this symptom series and that of the rare forms of poliomyelitis with which alone it could be confused, the clinical differences were more marked than the resemblances. (3) The results of the epidemiological inquiries were to the effect that encephalitis lethargica was not a form of acute poliomyelitis, and that its presence and epidemic prevalence depended on conditions other than those necessary for the presence and epidemic prevalence of that disease. (4) Marinesco and McIntosh, as a result of separate researches, arrived independently at the conclusion that encephalitis lethargica, as it appeared in the present outbreak, is identical with the illness described by von Economo in Austria and Professor Netter in France, and that it was a disease *sui generis*, anatomically and clinically distinct from analogous affections.

A. S. MacNalty⁶ described the condition of encephalitis lethargica occurring in the recent outbreak as an acute illness in which nervous localizing signs might or might not be present. There were three types: (1) A type displaying general disturbances of the functions of the central nervous system, but without localizing signs. (2) Types with nervous localizing signs: (a) Clinical affection of the third pair of cranial nerves; (b) Affections of the brain stem and bulb, with local lesions of other cranial nerves; (c) Affections of the long tracts—e.g., pyramidal, pre-pyramidal, and upcoming afferent tracts; (d) Ataxic types (involvement of cerebellar mechanism); (e) Affections of the cerebral cortex; (f) Types indicating some evidence of spinal-cord involvement; (g) Polyneuritic type. (3) Mild or abortive types, with or without localizing signs in the central nervous system. The *incubation period* was probably variable. The *prodromal period* commonly ranged from the first to the seventh day, but might be as protracted as three weeks, during which occurred lethargy, headache, giddiness, and diplopia, as well as lassitude, fatigue, vomiting, and diarrhoea. The *acute manifestation* included slight early rise of temperature (to 101° or 102°), marked asthenia, catalepsy, stupor (alternating with nocturnal delirium), emotional changes, changes in speech (which became either nasal, monotonous, and slurred, or chattering, rapid, and unintelligible), fibrillary movements, and choreic movements of face, trunk, and limbs. Muscular pains, hyperæsthesia, retention or incontinence of urine, incontinence of faeces, sweating, skin eruptions, and dysphagia might also occur. Marked constipation was the rule. The rapid, complete, or partial clearing of the paralysis was the most remarkable feature of the types with nervous manifestations. Mild or abortive types were rare. Recovery was gradual and tedious, chiefly on account of the great prostration and muscular weakness. Death appeared to be due to paralysis of the respiratory centre in the medulla, and was preceded by intensification and frequency of delirious attacks, deepening of the stupor, and coma.

Crookshank⁷ gave statistics of 127 cases observed by him early in this year, and considered by him examples of Heine-Medin disease. Of these, 77 were males and 50 females. Under five years there were 28 cases (17 males and 11 females); and over ten years 70 cases (44 males and 26 females). There were 26 deaths (or 20.39 per cent), and 11 post-mortems were performed.

Cerebrospinal Fluid.—In 43 cases cytological reports were made. In 25 cases lymphocytes, and in 4 cases leucocytes, were found in excess. In 6 cases lymphocytes, and in 2 cases leucocytes, were in marked excess. Protein was present in excess in 26 cases. Organisms were found in 16 cases, no organisms in 12, Gram-negative organisms in 2, and Gram-positive in 2.

History and Mode of Onset.—A history of injury to the head occurred in 9 cases, of tooth extraction in 2. There was a two-stage history in 46 cases, sudden onset of nervous symptoms without previous illness in 36, gradual onset of nervous symptoms in 17, whilst the onset was undetermined in 28.

General Symptoms.—Sweating was marked in 13 cases, diarrhoea in 7, and constipation in 29. Glycosuria occurred (without previous history of it) in 1 case, acetonuria in 4 cases. At the onset vomiting occurred in 38, pain in hypochondria in 13. Rashes occurred in 27 cases: erythematous in 12, miliarial in 2, petechial in 5, and herpetic in 8, and of these 6 were labial and 2 gluteal. Desquamation was observed in 2 cases, joint swelling in 2, oedema of the legs in 1, enlargement of glands of head and neck in 1, and bedsores occurred in 1. Dental irregularities were not positively recorded in more than 10.

Signs and Symptoms referable to Nervous System.—

Mental.—Emotionalism or 'hysteria' was marked in 5 cases. Mutism (apart from silence during drowsiness) was noted in 7 cases. Delirium was marked in

19, maniacal delirium noted in 2, 'acute delirious mania' following 'stupor' in 1, delusions or hallucinations (apart from delirium or mania) in 3. Nocturnal sleeplessness with diurnal drowsiness was marked in 3 cases, 'drowsiness' in 30, stupor or prolonged lethargy in 26, 'unconsciousness' or coma in 25, and sequential dementia in 5 cases.

Physical.—Epileptiform fits or convulsions were present in 15 cases; tremors, twitching, or choreiform movements were marked in 22, trismus in 2, head retraction in 23, and limb spasticity in 29. Paresis or paralysis of limbs (apart from general asthenia), occurring transitorily or otherwise without hypertonia, was noted in 47 cases, atrophy of limb-muscle groups (apart from generalized muscular atrophy) in 10, facial paralysis (other than transitory) in 8, amaurosis (partial or marked) with slight changes in papilla in 5, ptosis was marked and persistent in 23, strabismus occurred in 19, nystagmus in 14. Deafness and tinnitus were marked in 5, dysphagia occurred in 5, hypoglossal palsy was marked and persistent in 5, pain and tenderness in limbs were marked in 11, and formications, tinglings, and numbness in 6. In 6 cases ascending paralysis occurred, and in one case (not included in the above statistics) trophic changes and gangrene of the finger-tips appeared, probably due to an acute ascending central myelitis.

Buzzard⁸ refers to the usual type characterized by asthenia, lethargy, and disorders of ocular movements, such as strabismus, diplopia, nystagmus, and ophthalmoplegia. These were patients suffering from encephalitis with its chief incidence on the brain stem. This important discovery was quickly followed by the realization that there were other patients taken ill in the same way, presenting the same constitutional disturbances, the same asthenia and lethargy, but displaying no oculomotor signs or symptoms. On the contrary, they presented the *clinical picture of acute paralysis agitans*: the mask-like expressionless face, the rigid but not really paralyzed limbs, the tremor, the posture, and gait of that disease. Here were examples of encephalitis with its chief incidence on the basal ganglia, and in particular, perhaps, on the *globus pallidus* (see PARALYSIS AGITANS). Other cases were described in which the cerebral cortex was chiefly affected, with hemianopia and convulsive seizures.

REFERENCES.—¹*Brit. Med. Jour.* 1918, Oct. 26; ²*Med. Supp. Rev. Foreign Press*, 1918, Aug., 262; ³*Lancet*, 1918, Nov. 2; ⁴*Ibid.* 591; ⁵*Ibid.* 591; ⁶*Ibid.* 592; ⁷*Ibid.* 593; ⁸*Ibid.* Dec. 21, 835.

ENDOCARDITIS, ULCERATIVE.

Carey Coombs, M.D., F.R.C.P.

ETIOLOGY.—The view of disease which the era of morbid anatomy gave us was altogether too stiff and mechanical. Something attacked a part of the engine and put it out of gear, and this upset the whole affair, just as a choked carburettor or a dirty sparking-plug may. This was the kind of view of heart disease which filled the text-books a generation back. But the physiologist and the bacteriologist have made us see that it is by no means so stilted and settled an affair. The tissues of the heart are preyed upon by living and tenacious enemies. Even chronic valvular disease is not merely a mechanical form of disability, which kills by hampering the heart in its work and gradually wearing it down. It does this indeed, but in many cases there is more in it than this. There is that at work within the heart which steadily increases the valvular imperfection, and at the same time pours poison into every capillary and every cell within the body, to wit, an active infection of the endocardium. The insidious character of this infective process is very well described by Lutembacher.¹ The patient is one whose cardiac lesion is an accepted fact, and when irregular and discontinuous fever appears, one's mind may fail to connect the two things for some time. But the course of the disease is towards death,

partly by slow poison and partly by increasing ineffectiveness of the heart's action; and after death it is found that micro-organisms have been at work upon its inner surface. The old aphorism as to the susceptibility of an already injured valve to the attack of a new infection is given a modern application by Lutembacher, who reminds us of the particular need for scrupulous asepsis in injection of drugs into the veins of persons known to have a diseased cardiac valve.

Unfortunately, however, the problem of saving diseased valves from additional infection is not always as simple as that. More often than not it is difficult to conceive by what means the organisms can have entered the circulation. Sometimes, it is true, the whole story is plain. For example, Karsner² brings forward an interesting series of 14 cases in which men wounded in war became the subjects of acute valvular infection. These were mainly streptococcal infections, and wounds of joints or other serous cavities predominated.

Cases recorded by Malloch and Rhea³ prove that influenzal bronchopneumonia may be terminated by endocarditis due to *B. influenzae*, which presumably enters the system through the damaged lungs. Other examples of infection of the heart by organisms entering through the respiratory tract are furnished by Stewart and Flint,⁴ in whose case a pleomorphic diplococcus was apparently introduced to an already damaged heart by an attack of influenza; and by Schultz,⁵ whose patient was killed by infection of the cardiac valves by an organism usually harmless—*M. pharyngitidis siccae*—but gaining access to the system during an acute bronchial infection.

But in that large group of cases of chronic streptococcal ulceration of the valves of which Hudson⁶ records an example, how does the organism enter? Possibly influenzal infection and the lowered resistance of war-time account for the recent high incidence of such cases. The similarities between this organism and those of the alimentary tract hint at some portal of entry through lesions of the digestive tube, perhaps in the mouth, perhaps lower down. If so, prevention can only be possible by raising resistance.

REFERENCES.—¹*Presse Méd.* 1918, 546; ²*Arch. Internal Med.* 1918, Sept., 296; ³*Quart. Jour. Med.* 1919, April, 174; ⁴*Lancet*, 1919, i, 1114; ⁵*Jour. Amer. Med. Assoc.* 1918, ii, 1739; ⁶*Brit. Med. Jour.* 1918, ii, 512.

ENDOTHELIOMATA, MULTIPLE, OF THE SKIN. (See SKIN, NEOPLASMS OF).

ENTERITIS. Glucose recommended in (p. 7).

EPILEPSY:

J. Ramsay Hunt, M.D.

Premonitory Signs or Precursors of the Epileptic Paroxysm.—These are not infrequent, and when they do occur have a considerable practical importance in that the patient or family receives some warning of the impending seizure. The nature of the warning varies in different cases. It may be subjective or objective in its characteristics, as the case may be. Such prodromal signs may appear hours or even days before the attack, and are of a definite fixed nature. They are not to be confused with the *aura* which immediately precedes the attack. Hartenberg¹ divides them into five groups:—

1. *Sensory.*—Under the heading *general sensibility* may be classified subjective sensations of heat or cold; various tickling and itching sensations of the skin, nose, and urethra; genital pruritus in women; pain in scrotum and testicle in men; headache and neuralgic conditions. Among the *special sense* prodromes are bizarre gustatory sensations, usually of a disagreeable or foetid nature; sneezing.

2. *Circulatory.*—Pallor or congestion, rarely in circumscribed areas; also urticaria, slight oedema, and cyanosis of the hands.

3. *Motor*.—General or partial tremors are among the motor precursors of the attack. Myoclonic or muscle shocks also occur; grinding the teeth; marked muscular weakness or fatigue; occasionally a difficulty in speech, which may reach a high degree of dysarthria.

4. *Visceral and Secretory*.—A coated tongue, bitter taste, salivation, nausea, loss of appetite, brouimia, and constipation are among the digestive prodromes. In the respiratory sphere, a feeling of suffocation, a sense of pressure or strangulation, and incessant cough have been observed. Palpitation of the heart, tachycardia, irregular and intermittent pulse, and hypertension have also been marked. Also a tendency to incessant erections and nocturnal pollutions.

5. *Psychic*.—Very important and quite frequent are the psychic prodromes: bad humour, irritability, sullenness, querulousness, violence, and a tendency to contradiction (*esprit de contradiction*); also changes in mood, e.g., sadness, depression, anguish, and anxiety states. Euphoria, gaiety, and undue optimism have been observed, as well as disturbances of sleep—insomnia, dreams, and nightmares.

Of course many of these signs are common among normal people where there is no question of epilepsy or of an impending attack. The significant fact, however, is their recurrence in the epileptic in relation to the epileptic seizure, so that this fixed relationship and periodicity comes to have a distinct prodromal value. The signs when present are not invariably followed by an epileptic seizure, which may be suppressed or warded off; it is rare, however, for an epileptic seizure to occur without the accustomed prodrome. Hartenberg has observed certain special prodromal signs which have not heretofore received attention. In the ocular sphere he has noted that the eyes are more brilliant, the glance more fixed and somewhat strange. An enormous pupillary dilatation may occur, also a sensation of a 'flake of fire' in the visual field, and convergent strabismus. Among the strange prodromes noted was a unilateral grin or grimace. The nose or ears may become red. Profuse perspiration may take place; there may be a slight sensation of temperature. In one person grandiose ideas and projects usually preceded the attack.

Influenza and Epilepsy.—The inhibitory influence of acute infections on epileptic seizures has been known since the age of Hippocrates. The attacks may be only diminished in number during the course of an acute febrile disturbance, or they may cease entirely. Rarely a permanent cessation of the epileptic manifestation has followed, and constitutes one of the 'freak cures' which are occasionally observed in the course of this interesting malady.

Maillard and Brune² have studied the influence of the recent influenza epidemic in the epileptic wards of the Bicêtre. The epidemic was very severe, and 63 cases came down with the disease. In all cases the 'attacks' ceased during the acute febrile period. They recurred, however, with the fall of the temperature to normal and the subsidence of the infection. The authors suggest the possible therapeutic value of such a peculiar inhibitory reaction, and say that it speaks favourably for the efforts of Guiraud³ to influence the disease by treatment with antitoxins and vaccines. Very curious was the apparent effect of epilepsy and the epileptic constitution upon the group. The influenza assumed an especially grave form in the epileptic wards; among 63 cases there were 22 simple types and 41 with complications, chiefly pulmonary. There were 32 deaths: 14 with pneumonia, 15 with bronchopneumonia, and 3 with oedema of the lungs. The unusual gravity of the disease is partly due to the reduced physical condition of this group of cases, and the inadequate nourishment which they received during the war. In large part, however, it was due to the epileptic condition, with its increased tendency to congestive complications.

Value of Salt-free Diet.—The Removal of all Salt from the Dietary of the

epileptic is an old method of treatment which has fallen into disuse because of its failure to produce any appreciable results in the vast majority of cases. From time to time, however, favourable results are still reported, and there seems to be no question that certain types of the disease are benefited by this form of treatment. Miraillet⁴ insists that salt should be discarded absolutely, as also tea, coffee, and alcohol. Then the doses of bromides can be materially reduced, and such improvement may then be realized that it amounts to an actual cure. He gives a moderate dose of the bromide every day, without interruption. When his patients go thus two or three years without seizure, he reduces the dose of the bromide, but emphasizes that absolute abstinence from salt is the main thing. In his first series of 181 cases, only 83 followed his instructions. At that time he ordered merely restriction of salt. In 12 cases the results were negative, in 18 there was improvement, and 53 had no further seizures. Since 1912, 52 of a later series of 133 cases followed instructions, and 31 have had no further seizures, and 18 have been much improved; more or less benefit has been realized in all but three cases.

Alcohol as a Factor in the Production of Epilepsy and Allied Convulsive Disorders.—This is discussed by D. A. Thom,⁵ pathologist to the Monson State Hospital. This factor may have its origin in either the parents or the patient.

The use of alcohol by the parents may occur in any one of the three following ways: (1) Chronic alcoholism in one or both parents; (2) Acute intoxication of one or both parents at time of conception; (3) The use of alcohol by mother during pregnancy. Dejerine claims that in France over one-half the epilepsy in children is due to alcoholic parents. Stuchlik writes from Bohemia that his study of family histories of 176 epileptics showed: alcoholism in one or both parents, 36 per cent; among the grandparents, 38 per cent. He states further that in 50 per cent of the cases in which parents were alcoholic, the collaterals and grandparents were healthy. Bingwanger attributes 22 per cent of the epilepsy in Germany to alcoholism; while in the United States, Spratling, from the Craig Colony, gives 14 per cent. Thom's own tables, compiled from the records of the Monson State Hospital, showed that 14.6 per cent of the cases with hereditary predisposition may be attributed to alcohol.

The remaining portion of the paper considers alcohol solely as an etiological factor: first, by acting directly upon the nervous system, usually predisposed by hereditary taints, and producing convulsions in a comparatively short time; second, by effecting intermediate changes outside the central nervous system, of which chronic kidney disease and arteriosclerosis are the best examples. Seizures associated with chronic kidney diseases are usually of the *grand mal* type, are apt to occur in a series, and are not often associated with mental deterioration, many of these cases dying in coma following convulsions. The convulsions associated with arteriosclerotic cases, or, more specifically, cerebral endarteritis, do not usually occur in series, and are usually associated with dementia. Many of these cases die from cerebral hæmorrhage following a convulsion. Notwithstanding the fact that we are often unable to establish any cause for the convulsion other than alcohol, Thom is strongly of the opinion that in a perfectly stable and well-adjusted nervous system alcohol *per se* is not sufficient to produce convulsions.

REFERENCES.—¹*Presse Méd.* 1919, April 17, 205; ²*Ibid.* Feb. 10, 70; ³*Paris Méd.* 1918, Oct. 5; ⁴*Bull. de la Soc. Méd. des Hôp.* 1918, June 28, 637 (also *Jour. Amer. Med. Assoc.* 1918, Nov. 2, 1521); ⁵*Boston Med. and Surg. Jour.* 1919, July 10, 42.

EPIITHELIOMA ADENOIDES CYSTICUM. E. Graham Little, M.D., F.R.C.P.

Graham Little¹ reports a case, the nature of which was demonstrated by histological examination, and which has a somewhat special interest, as it has been mistaken for many years for an example of molluscum contagiosum. The

PLATE XI.

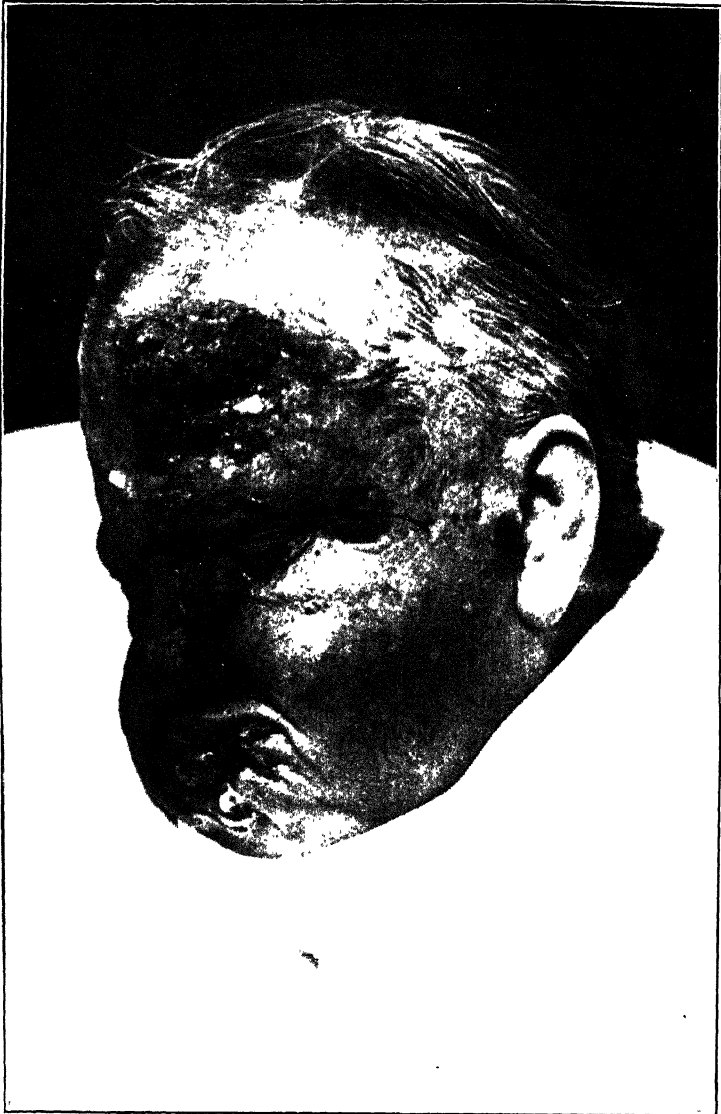
EPITHELIOMA ADENOIDES CYSTICUM



By the kindness of Dr. Walker-Love, Airdrie.

PLATE XII.

EPITHELIOMA ADENOIDES CYSTICUM—*continued*



patient was a woman of 54, who had been seen by the late Dr. McCall Anderson thirteen years previously, and pronounced by him to be a case of molluscum contagiosum. During the interval between this date and the present time, many of the originally intact tumours, some of which had lasted for thirty-five years, had ulcerated, and formed large masses which were demonstrated later to be secondary epitheliomata. The excellent illustrations of this case (*Plates XI, XII*) have been supplied by the generosity of Dr. Walker-Love, of Airdrie, under whose care the patient has been for the past thirteen years. Graham Little² has pointed out the striking clinical similarity which the early tumours of this rare disease bear to molluscum contagiosum, and the case is of importance in serving as a warning to follow up one's cases of molluscum contagiosum if these are not immediately cured.

REFERENCES.—¹*Brit. Jour. Dermat.* 1919, Oct.-Dec., 193; ²*Ibid.* 1914, May.

ERYSIPELAS.

E. Graham Little, M.D., F.R.C.P.

Avata and Woodyatt,¹ after trying various methods in the treatment of an epidemic of erysipelas in a military camp, found the most satisfactory results with a procedure which is thus described. Collodion, U.S.P. (non-flexile) is painted with a cotton swab or brush to form a stripe half an inch wide and from half an inch to an inch in advance of the line of induration, in such a way that the diseased area is completely circumscribed. The collodion stripe is painted over repeatedly until, when dry, it makes a deeply-constricted furrow not broken or imperfect at any point. On the following days the collodion line is inspected for breaks, cracks, or inadequate constriction at any point; if found, these are repaired by further coats of collodion. When enough collodion is used to produce a continuous and sufficiently deep (from half to three-quarters of an inch) linear constriction of the skin, the erysipelatous induration advances to the collodion, but not beyond it. The collodion is left in place until the temperature and swelling have wholly subsided. If there is a break in the collodion line, or if the skin constriction is too shallow, the disease may pass through or under it.

TABLE OF COMPARATIVE RESULTS OF THE TREATMENT.

Total cases from Nov. 6, 1917, to May 15, 1918 ..	..	..	104
Cases treated by collodion circumscription ..	..	..	23
Cases treated by all other methods ..	..	..	81
Collodion Cases			
Average stay in hospital ..	15 days	All Others	30.4 days
Average febrile period ..	3.5 days		8.1 days
Average maximum temperature ..	103° F.		104.5° F.
Incidence of complications ..	6.6 per cent		15.3 per cent

The collodion treatment is supplemented by the continuous application of **Cold Compresses** wet with a saturated solution of **Magnesium Sulphate**, and by general measures such as are rational in any febrile condition. (*See also Mercurie Chloride*, p. 10).

Huy² reports on his experience with **Polyvalent Antistreptococcic Serum**, and claims success in 75 per cent of the cases so treated. There was a significant fall in temperature, pulse-rate, and respiration, the toxic symptoms declined, and the patients were more comfortable in every respect. Local applications of **Boric Acid** were used as well.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, Sept. 14, 900; ²*Ibid.* 1919, Aug. 9.

ERYSIPELAS, FACIAL.

Herbert French, M.D., F.R.C.P.

Serum Treatment.—It is commonly stated nowadays that polyvalent anti-streptococcal serum is of little or no value in the treatment of erysipelas; and from whatever source this dictum may have emanated, it has been repeated

so widely and by so many people that it appears to be the general view held by the profession. [My own personal experiences are to the contrary, and I consider that the use of antistreptococcal serum in cases of erysipelas, whether of the face or of some other part, is a most valuable adjunct to whatever local treatment may be employed for the erysipelas region itself.—H. F.]

Basset¹ records a similar belief from recent personal experience in France, in which in 10 consecutive cases of acute erysipelas of the face he used subcutaneous injections of polyvalent antistreptococcal serum of Leclainche and Vallée. In some of these cases the facial erysipelas had already existed a little

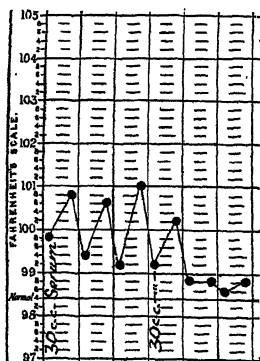


Fig. 7.

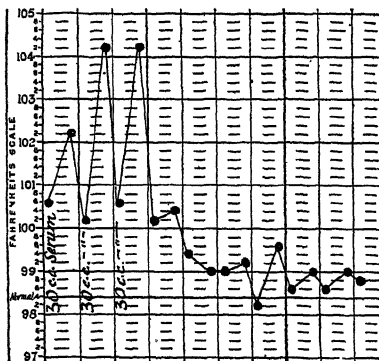


Fig. 8.

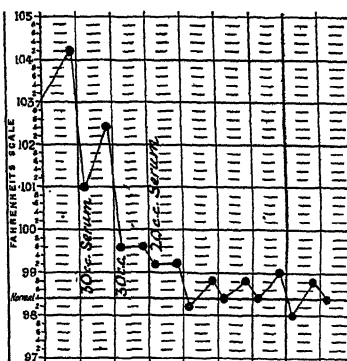


Fig. 9.

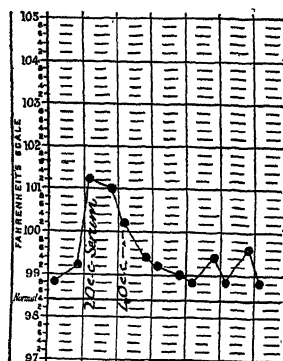


Fig. 10.

time before the serum was employed; in others the serum was "employed early"; but in all it was Basset's opinion that recovery from the facial erysipelas itself was most decidedly accelerated by the use of the serum. According to the severity and duration of the local streptococcal infection of the skin, he gave 1, 2, or 3 injections, sometimes employing 10 c.c. as the dose, sometimes 20 c.c. in one day; and in the worst cases giving 10 c.c. daily for three consecutive days. The accompanying temperature charts (Figs. 7-10), from his original paper, illustrate the course the cases ran, and also show the days when the injections were given.

The general results are summarized by him as follows:—

Case	Dose per Injection	Number of Injections and intervals between	Days required for cure
1	10 c.c.	2 (successive days)	5
2	10 c.c.	2 (2 days' interval)	6
3	{ 30 c.c. twice 40 c.c. (twice)	} 4 (successive days)	5
4	30 c.c.	{ 4 (daily for 3 days, then after 2 days)	6
5	30 c.c.	3 (successive days)	3
6	{ 30 c.c. (twice) 20 c.c. (once)	} 3 (successive days)	4
7	{ 30 c.c. (twice) 20 c.c. (once)	} 3 (successive days)	4
8	30 c.c.	2 (2 days' interval)	4
9	30 c.c.	3* (successive days)	7
10	{ 20 c.c. 40 c.c.	} 2 (successive days)	3

* Two injections of copper sulphate given on the two subsequent days.

REFERENCE.—¹*Presse Méd.* 1919, May 1, 237.

ERYTHEMA MULTIFORME.

E. Graham Little, M.D., F.R.C.P.

Guy¹ reports an extraordinary epidemic of erythema multiforme during February and March, 1918, in a Texas military camp. In all, 47 cases were seen, the cutaneous pictures of which varied through all grades from mild erythematous lesions to those showing all manner of individual lesions or a preponderance of vesicular and bullous lesions on skin and mucous membranes. In most of the cases with extensive skin involvement the onset of the disease was heralded by a mild chill or chilly sensations, followed by a febrile reaction that continued over a period of from fourteen to twenty-one days. The temperature curve was irregular, but showed a tendency to an evening rise and a morning remission, all ending by lysis. Many of the patients observed had a rise of temperature for two or three days only, the highest recorded temperature being about 100°. Several had no abnormal temperature. There were purpuric lesions in approximately 10 per cent of the cases. Only two gave a history of an attack prior to enlistment, while 10 of the 47 returned to the hospital with a second attack, 1 with a third. There was a simultaneous epidemic in the same camp of streptococcal respiratory affections, due in the majority of cases to *Str. hæmolyticus*, but this organism could not be grown from the skin cases, nor did the infected cases show positive agglutination tests with the organism; but in 30 of the skin cases a hæmolytic streptococcus was found in tonsillar crypts as the predominant bacterium. On this finding, all cases with this tonsillar infection were ultimately subjected to tonsillectomy, with apparent benefit in reducing frequency of second attacks.

Stokes² produces some evidence for the proposition that tuberculosis plays a considerable part in the causation of eruptions clinically indistinguishable from erythema multiforme.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, Dec. 14, 1993; ²*Amer. Jour. Med. Sci.* 1919, Feb., 157.

ERYTHEMA NODOSUM.*E. Graham Little, M.D., F.R.C.P.*

Stokes¹ contributes an important paper based on a study of ten cases, and comes to the conclusion that tuberculosis is a much more frequent factor in the production of the symptomatic disease known as erythema nodosum than any other single cause. This view has been supported by many recent writers, notably by Landouzy, and it is important that its recognition should be wider among general practitioners, as the appearance of the eruption of erythema nodosum may be the earliest symptom of tuberculosis, which may thus secure treatment which is especially valuable in the initial phases. Stokes tabulates the cases of erythema nodosum as falling into three classes, according as tuberculous (the most frequent), streptococcal, or diphtheroid causation is demonstrated. The last, so ably established by the researches of Rosenow in 1917, is the least frequent. Clinical differentiation of the three types is probably at present impossible, so the author advises the practitioner to make special investigations for tuberculosis in every case; such investigations should include careful search into tuberculous antecedents, consideration of weight and temperature curves, examination for possible foci of tubercle in lungs, tonsils, and glands, careful inspection of the skin for scars, pigmentation, or signs of tuberculides, and the subject of erythema nodosum should be regarded as a suspect of tuberculosis and be periodically examined for a prolonged period after all eruption has disappeared. The author considers it probable that many cases of erythema nodosum are preliminary stages of true tuberculous erythema induratum.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1919, Feb., 157.

EXOPHTHALMIC GOITRE. (*See THYROID.*)**EYE AFFECTIONS ASSOCIATED WITH DISEASE OF OTHER ORGANS.***R. Foster Moore, F.R.C.S.*

Narrow and Spiral Fields of Vision in Hysteria, etc.—Narrowing of the visual field in hysteria was first drawn attention to by Charcot, and this, combined with a spiral contraction, has by many clinicians come to be accepted as an important clinical manifestation of hysteria. It is with something of a shock then that one learns from A. F. Hurst and J. L. M. Symms¹ how useless this sign is. Its value was disputed by Balinski, and although it was at first accepted by Morax, he, too, afterwards came to see its fallacy. Hurst and Symms state that, apart from hysterical amblyopia, "We have never seen patients with hysterical symptoms who spontaneously complained of disabilities resulting from a narrow field of vision, however closely they were cross-examined on the subject". Further, "We have examined numerous soldiers suffering from various war neuroses—some of whom were suffering from gross hysterical symptoms, and we have never found any retraction of their field of vision until they were tested with the perimeter. But the perimeter invariably resulted in the suggestion of a narrowed field, however carefully it was used". Moreover, if the examination was continued after the first field was marked out, a spiral field was always obtained. It has generally been taught that a spiral field of vision is a result of fatigue. "We have found that this is not the case, the inward spiral, which alone has hitherto been described, being a result of the method employed in using the perimeter". It is shown that if the white disc of the perimeter is made to move from the centre outwards, an *outward spiral* (Fig. 11) is always obtained; that by this means an inward spiral may be obtained in one eye and an outward one in the other; and, indeed, that in the same eye an outward spiral may be obtained at one time and an inward one at another, according as the white object-square is

moved from within out or from without in (*Fig. 12*). It is made clear that a spirally contracting field is valueless as a sign of hysteria.

Hysterical Disorders of Vision.—An instructive article is contributed by Lewis R. Yealland.² The cases that he has come across are blepharospasm, 8; spasm of accommodation, 4; ptosis, 1; disturbance of visual fields, 2; amblyopia, 5. Hysterical disorders of vision may be grouped clinically into two

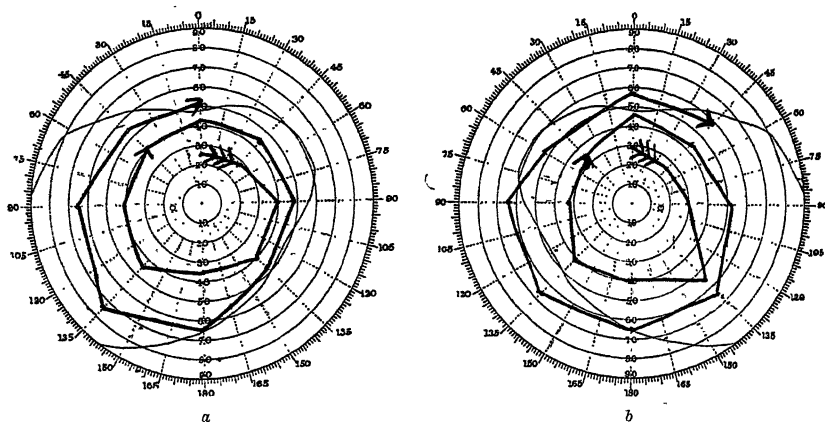
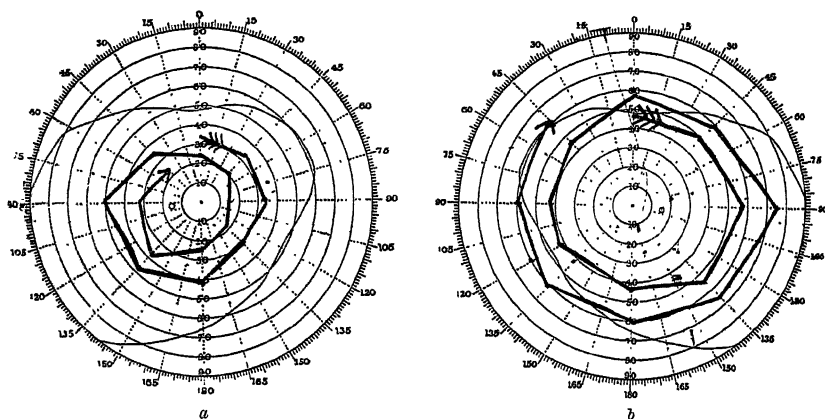


Fig. 11.—Spiral fields in a case of hysterical tremor following shell shock. *a.* Left eye. Within-outward spiral field. *b.* Right eye. Within-outward spiral field.



As an example of the lines of treatment adopted, a case of blepharospasm may be taken. A pad electrode is placed over the spine, and a key electrode is applied to the closed lid for a few seconds; the patient is then ordered to read $\frac{6}{60}$. If he fails, a stronger current is applied for a longer period, and this is continued until $\frac{6}{60}$ is read. When this occurs, the current is reduced, and he is allowed longer to read $\frac{6}{36}$, and with encouragement and a continuation of faradism he is ultimately induced to read $\frac{6}{18}$. When this is accomplished, it is found that the spasm has disappeared. It is found that when once the patient has succeeded in reading $\frac{6}{18}$, his mental attitude is changed from a state of apathy to one of hope, and he is readily persuaded to read $\frac{6}{9}$. Other cases are treated on similar principles.

Familial Optic Atrophy (Leber's Disease).—Much interest attaches to the suggestion first put forward by Mr. Herbert Fisher (*Ophthalmoscope*, August, 1916) that Leber's disease is associated with disease of the pituitary body. James Taylor³ contributes to this subject. He observes that Fisher points to the recognized neuropathic states occurring with Leber's disease—vertigo, headache, or even epilepsy—and points out that both in Leber's disease and in pituitary disease subjective phenomena of light and colour may occur; he also points out the intimate association of pituitary with sexual functions, and that Leber's disease tends to occur either with the onset of sexual development or with its decline. Taylor refers to a paper written by himself and Gordon Holmes (*Trans. Ophthalm. Soc. U. K.*, xxxiii) on several cases of hereditary optic atrophy in a remarkable family. Much interest is added, as Taylor now publishes the fact that two additional members of the family have developed optic atrophy, one at the age of 50 and one at 52. Skiagrams of the skulls of these two, showing abnormality of the pituitary fossa, are given. Dr. Taylor is of opinion that they strongly support Mr. Fisher's view.

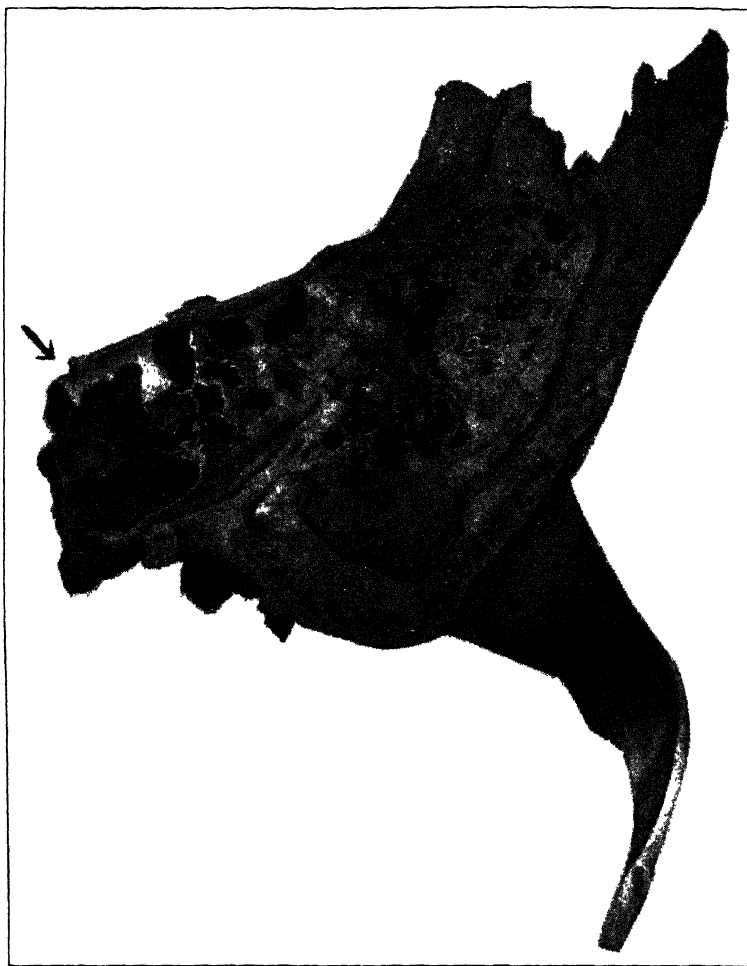
Familial Macular Degeneration with and without Dementia.—An important and lucid account of this condition is given by Howard Clark.⁴ He first points out that Tay-Sachs' disease and familial macular degeneration with and without dementia cannot be sharply delimited the one from the other; they appear to merge into each other. He adopts Oatman's two types, the 'macular type', in which the eye alone is involved and which develops about the age of puberty, and the 'maculocerebral type', in which dementia is associated with the eye condition and which develops about the age of the second dentition between the fifth and seventh year. There is gradual loss of central vision, the peripheral field remaining complete; nystagmus develops later. Ophthalmoscopically, there are degeneration of the macula and also fine perimacular changes; the retinal vessels remain normal. The general health remains good in the macular type. In the second type, associated with dementia, which is less common, the eye changes and the cerebral symptoms commence together, and optic atrophy occurs; two new cases are reported.

As regards etiology, neither syphilis nor consanguinity is a necessary factor, and all reported cases but three were in Gentiles, exhibiting a strong contrast therefore to Tay-Sachs' disease, which occurs almost exclusively in Jews. The development of the eye and cerebral defects is gradual in both types.

Eye Changes in Icterohemorrhagic Spirochaetosis.—L. Weekers and J. Firket⁵ show first that in 92 per cent of cases hyperæmia of the anterior segment of the eyeball is present. The hyperæmia is localized in the ciliary region, and indicates the presence of the spirochæte in the uveal tissues. Subjective symptoms are usually slight. In some cases, however, a definite iritis or iridocyclitis is developed and calls for active treatment. Van Schevensteen⁶ reports a case in which choroidoretinitis developed during the course of the disease.

PLATE XIII.

PARALYSIS OF SIXTH NERVE



Temporal bone with pneumatic petrous pyramid. Inner table has been removed, and a large cell is shown at apex directly under notch for sixth nerve.

By kind permission of the 'Journal of the American Medical Association'

Metastatic Ophthalmitis.—This is not a rare condition as a part of a general pyæmia or septicæmia. Children suffering from post-basis meningitis develop it not very infrequently, and many cases have occurred during the war. Pichler,⁷ points out that an early sign is the onset of a dilated and inactive pupil.

A. von Szily⁸ relates in detail four cases. Three died, and a post-mortem examination showed that in two of these both eyes were involved. In the first case pneumococci were recovered from the vitreous; in the second, streptococci; in the third, staphylococci were recovered from the vitreous and also from the blood; and in the fourth, streptococci were recovered from the vitreous. Coriat and Boulat⁹ also publish a fatal case in which both eyes were affected. Chenet has shown that of 22 bilateral cases all ended fatally.

Paralysis of the Sixth Cranial Nerve Associated with Otitis Media.—J. M. Wheeler¹⁰ gives a clear and concise account of cases which come under the title of Gradenigo's syndrome—i.e., cases showing: (1) Acute otitis media; (2) Paralysis or paresis of the abducent nerve of the same side; (3) Intense pain referred to the frontal, temporal, and parietal region of the same side. Cases of his own and other authors are given in some detail. He points out in a clear manner the direct anatomical basis of the syndrome. The sixth nerve just before entering the cavernous sinus lies in loose areolar tissue at the apex of the petrous bone, which may be excavated by pneumatic cells at this part which are in direct connection with the mastoid antrum (*Plate XIII*). The Gasserian ganglion, too, is in very close relation, lying in the *cavum Meckelii* on the front of the apex of the petrous bone, and becomes involved by direct extension. A number of other points of anatomical importance are brought out. This is a symptom-complex of which it is good that the ophthalmologist should be reminded.

Ocular Disease of Dental Origin.—Very numerous are the diseases of the eye which have been attributed at different times by different authors to oral sepsis; and whilst the relationship between them is usually very doubtful, there is this at least to be said, that nothing but good is likely to come of having the teeth put in order. This view is very fairly and reasonably expressed by W. F. Hardy.¹¹ He says: "It is incumbent upon ophthalmologists to consider the teeth in our list of possible etiological factors, but to refrain from making of this possibility a hobby to be ridden to death". On the other hand, L. Dor¹² reports two cases of optic neuritis and one of thrombosis of the retinal vessels which he claims are due to dental infection. One can only say it is impossible to prove that he is not correct.

REFERENCES.—¹*Brit. Jour. Ophth.*, 1919, Jan., 17; ²*Ibid.* 1918, Nov., 545; ³*Ibid.* 1919, May, 193; ⁴*Jour. Amer. Med. Assoc.* 1918, ii, 1799; ⁵*Arch. Méd. Belges*, 1918, April; ⁶*Ann. d'Ocul.* 1917, Dec.; ⁷*Klin. Monatsbl. f. Augenheilk.* 1915, June, 682; ⁸*Atlas der Kriegsaugenheilk.* Stuttgart, 1916; ⁹*Arch. d'Ophthal.* 1918, May-June; ¹⁰*Jour. Amer. Med. Assoc.* 1918, ii, 1718; ¹¹*Amer. Jour. Ophthal.* 1917, April; ¹²*La Clin. Ophth.* 1917, Sept.

EYE AFFECTIONS, GENERAL.

R. Foster Moore, F.R.C.S.

Group Study in Ophthalmology.—Park Lewis¹ emphasizes in his paper the need for breadth of view and a wide conception of general pathological processes on the part of the ophthalmologist. His plea is for the group study of diseases in general and of the eye in particular. He bases it on three broad statements: (1) With few exceptions the most serious inflammatory and degenerative intra-ocular diseases find their origin outside of the eye itself; (2) A readjustment of our present methods is imperative. Instead of working alone, either as individuals or in ophthalmic hospitals, we must associate together in groups representative of every branch of medicine; (3) Changes

of such far-reaching social and economic importance are already under way, that the higher efficiency which co-operative medical measures would ensure are being made a public demand; and it would be a source of pride for us to give form and direction to an advance movement that promises to be one of the greatest of the age.

Errors of Refraction and of Muscle Balance.—At the annual session of the American Medical Association, Section of Ophthalmology, four important papers on this subject were read by C. E. Emerson, F. S. Gardner, Walter L. Pyle, and Samuel Theobald.² A long discussion ensued. The general tendency in America is perhaps to give more minute attention to the different varieties of heterophoria than is done in England, and to testing for them at both reading and long distances. Minute errors of refraction, too, are blamed for many diverse symptoms. The prevailing opinion was for the general use of mydriatics for refraction work, except in patients of 40 years or over. Stress was laid upon the general consideration of the patient and his occupation. Important information is to be gathered with regard to the very numerous tests which may be used to discover the various anomalies. There was a widely-expressed opinion that the ophthalmologist should by all means evade any form of narrowness of outlook, for his special branch invades general medicine and surgery in a degree that no other special subject approaches. The discussion supplies most illuminating information on a subject the importance of which it is difficult to over-estimate.

Report on Standard Illumination of Snellen's Distant Test Types.—This is the result of a careful investigation by a Committee appointed by the Council of British Ophthalmologists. The Council points out³ that the testing of visual capacity is now an essential part of the physical examination of candidates for many of the public services—e.g., the Navy, Army, Mercantile Marine, Indian Civil Service, etc.—and that this test should therefore be carried out under standard conditions in fairness as well to the candidates as to the services concerned. The Committee's recommendations are as follow:—

1. *The Test Types* shall be of the dimensions laid down by Snellen, and printed on a matt-white surface.

2. *Illumination.*—(a) The minimum illumination on the test-card shall be such that its brightness shall be equivalent to that of a new card illuminated to at least three-foot candles. (b) The illumination of the test types shall be as uniform as possible. (c) Artificial illumination shall be used in preference to daylight. (d) The testing-room shall be moderately illuminated, and care shall be taken that there are no glaring lights or bright objects in the candidate's field of vision. (e) Extreme contrast between the illuminated test-card and the background shall be avoided.

3. *Method of Lighting.*—(a) The method of lighting described in this report shall be in general adopted (see Fig. 13); (b) This method shall be made compulsory for sight-testing in all public services.

Local Anæsthesia in Ophthalmic Surgery.—S. Johnson Taylor⁴ points out that in the first instance he was induced to do all sorts of operations on poor patients in his consulting-room, from the fact that he was not on the staff of an ophthalmic hospital. He states: "I have done excisions, removals of sacs, all sorts of squint operations, cataracts and iridectomies, etc., on my consulting-room couch, some of the extractions being simple ones, the patients getting up and walking home a mile or so afterwards, and not once have I had any complication of any kind whatever as a result therefrom". All sorts of operations have been performed under local anæsthesia, to the complete exclusion of a general anæsthetic; the advantages of this are pointed out. Tabloids containing 0.1 grm. of **Novocain** and 0.00025 **Suprarenin Borate**,

made by the Saccharin Corporation, are used. The solution is injected by means of a slightly curved needle, which is introduced at the inner or outer side of the cornea and is directed to the posterior pole of the eye.

Concomitant Squint.—Euphan Maxwell⁵ analyzes the results of the treatment of concomitant squint by her father's operation. There were 1201 cases; of these, 1121 were convergent, 179 divergent, and 1 upward squint. All the cases are most carefully and thoroughly analyzed. The following are some of the important deductions and conclusions. Early operation is desirable. In children between the ages of 2 and 4, benefit may be obtained by occluding the fixing eye, and this is continued for about eighteen months; in older patients improvement occurs for three months only. Up to the age of 12, advancements or shortenings only should be done, for fear of divergence later: after this age tenotomy may be done. Two types of divergent strabismus are described: (1) Due to convergence insufficiency; (2) Due to

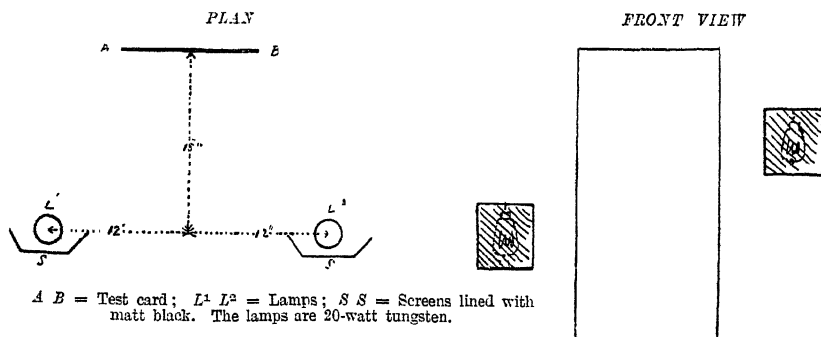


Fig. 13.—Diagram showing method of illumination of test types. (Kindly lent by the *British Journal of Ophthalmology*.)

divergence excess. For the first a shortening of the internal rectus is indicated; and convergence exercises are indicated for the last, with tenotomy of the external rectus if necessary. The ideal result to be aimed at in young children is parallelism with glasses; in older patients complete correction of the squint without glasses may be attempted. A comparison is drawn between the value of a shortening or tucking operation as compared with advancement. The author concludes in favour of the former for a number of reasons: (1) Ease of operation; (2) Rarity of altitudinal displacement; (3) The impossibility of the tendon slipping back; (4) Negligible interference with the health of the muscle; (5) The ease with which a re-shortening can, if necessary, be performed.

Infantile Blindness.—The National Committee for the Prevention of Blindness (New York) issues a new edition of its summary of State laws and rulings relating to the prevention of blindness from babies' sore eyes.⁶ The following are a few of the provisions:—

The compulsory reporting of babies' sore eyes to the local Health Officer. The local Health Officer is required to secure medical aid for uncared-for cases. Free prophylactic outfits are provided, and the use of a prophylactic is compulsory. The distribution by the State Departments of Health of popular educational leaflets.

Education of the Blind.—Edward Van Cleve,⁷ the Principal of the New York Institute for the Education of the Blind, gives a short account of the lines

upon which blind children are trained in America. Four lines of activity are followed in the training: literary, manual, physical, and special talent. The usual age of admission is eight years, and the complete education may cover eleven or twelve years. Gymnastic training is especially catered for. A marked contrast is clearly noticeable between those who have had full training and those who have had little or none. New York City has the New York Institute Classes for the Blind in its public schools, a Catholic Institute for the Blind, and a Home and Kindergarten for Blind Babies. There are the Perkins Institute at Boston, New York Institute for the Education of the Blind, and the Pennsylvania Institution; these are privately managed, but receive pupils from the State. The Maryland School for the Blind and the Western Pennsylvania Institute for the Blind are under private management; but the remainder of the schools for the blind in the United States are under the management of the State and are provided for by it. Forty-four State and private schools, and public-school classes for the blind in ten cities of the United States, enroll about 6000 students.

Filaria Loa.—Cobault⁹ reports two cases in which the worm was removed from under the conjunctiva. He points out that the seat of election of the *Filaria loa* is in the superficial integuments. The worm occurs specially in Africa, the Guinea Coast, Angola, and the Congo. A photo showing the worm accompanies the paper. A case is also reported by Elliot.⁹

Cysticercus in the Eyeball.—Gomes¹⁰ describes two cases in which he was able to remove the cysticercus successfully. One being in the anterior chamber was removed without difficulty; the other was removed from the vitreous chamber by incising the sclerotic, the procedure being guided by ophthalmoscopic examination.

Tuberculosis of the Eye.—Seidel,¹¹ following other authors, treated several cases of tuberculous eye disease with advantage by **Direct Sunlight**. The method used was to cut a small hole 2 mm. in diameter in a black card, and to direct the narrow pencil of light on to the affected part. The exposure at first is half a minute, and increased to two minutes. This is repeated daily if the sun permits. He has observed no ill effects. It is a method which is really worth a prolonged trial.

For the use of **Diathermy** in eye affections (p. 29).

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, i, 1893; ²*Ibid.* 1817-1831; ³*Brit. Jour. Ophth.* 1919, Jan., 22; ⁴*Ibid.* 1918, Dec., 607; ⁵*Ibid.* 1919, Aug., 340, and Sept., 408; ⁶*Ibid.* 1919, May, 206; ⁷*N. Y. Med. Jour.* 1919, ii, 54; ⁸*Bol. d. l. Soc. d. Ophth.* Buenos Aires, iv; ⁹*Brit. Med. Jour.* 1918, May 4; ¹⁰*Ann. Paulistas d. Med. e. Cir.*, S. Paulo, Brazil (abstr. in *Jour. Amer. Med. Assoc.* 1919, i, 1945); ¹¹*Arch. f. Ophthal.* 1917, xciii, pt. 3.

EYE, INJURIES OF, Etc. (See also UVEAL TRACT, DISEASES OF.)

R. Foster Moore, F.R.C.S.

Enucleation, Etc.—S. Weigelin¹ does not consider that the grafting of cartilage, etc., for the improvement of stumps is desirable in war injuries. The grafts sometimes give trouble, and he has had to remove them. He gives notes of a case where sympathetic ophthalmitis followed evisceration. He considers that the cosmetic result of the simple operation of enucleation is little, if at all, inferior to that obtainable by the more complicated methods.

Zarzycki² advocates the transplantation of a portion of the inner face of the tibia into the orbit after enucleation in order to obtain a good stump for a glass eye. He states that not only does the graft survive, but new bone-tissue is formed. [It is just this latter that one would fear, lest a large uncontrollable development of bone should occur in the orbit. In spite of the numerous new suggestions in this connection, a glass ball in Tenon's capsule is the best treatment; if put in properly they are never extruded.—R. F. M.]

The chief reason that is adduced for evisceration of a suppurating eye, as opposed to enucleation, is the danger of meningitis from spread along the optic nerve sheath. Very few cases of the complication, however, are on record. A. J. E. Lister³ reports one such case, and to avoid it recommends removal of the anterior part of the globe behind the ciliary region and then eviscerating, leaving the muscles undisturbed. A good stump is obtained.

Pagenstecher⁴ puts forward a plea for *optociliary neurotomy* as a substitute for removal of the eye in certain cases such as absolute glaucoma, total staphyloma, and perforating wounds, where removal is refused by the patient. Few surgeons would be content in this last case to leave the damaged and useless globe, for fear of sympathetic ophthalmitis.

Foreign Bodies.—H. P. Gibb, F. A. Juler, and R. Foster Moore⁵ give the results of their large experience of the treatment of intra-ocular foreign bodies at a base hospital in France. The authors were in charge of the only **Giant Ring Magnet** in that country. X-ray localization was made little use of, partly from reasons of expediency, but also because the magnet told whether a foreign body which was magnetic was or was not present, and this x rays fail to do, and it is this information only that is needed from the point of view of immediate treatment. No doubt the best route for removal is by bringing the body forward into the anterior chamber by the giant magnet, and afterwards removing it from this position by means of a small hand magnet. In some cases, however, removal is best carried out by incising the sclerotic.

In certain instances, owing to the minute size of the foreign body, it is impossible to get sufficient pull upon it to bring it into the anterior chamber. In such cases the exact localization can be ascertained by noting the spot at which application of the smallest rod causes pain; this spot can be found with surprising accuracy. The eyeball is now fixed by means of a silk stitch passed through the conjunctiva on the one hand, and the skin of the lids or cheek on the other; a flap of conjunctiva is turned back from over the site of the fragment as ascertained previously, the sclerotic is punctured by a narrow Graefe's knife, the wound enlarged if necessary as the knife is withdrawn, and in five out of six cases the minute fragment came out on the end of the magnet at its first introduction. If the two precautions as to fixation of the globe and enlarging the incision are observed, there need not be the slightest loss of vitreous. The authors, after experience with both the ring magnet and the Haab, are distinctly in favour of the ring.

The prognosis in cases of intra-ocular foreign bodies is much better in civil than in military practice, as noted by H. Frenkel⁶; this is chiefly because in the former they are usually clean, small, smooth chips of metal, and are removed early. Frenkel puts forward a plea for the use of a weak magnet where the fragment is large and a strong power where it is minute. The giant ring magnet is well adapted to this end.

Deformed Eyelids.—Those concerned with the repair and restoration of deformed eyelids the result of trauma should consult an illustrated paper by von Blaskovics.⁷

REFERENCES.—¹Klin. Monatsbl. f. Augenheilk. 1917, Sept.-Oct.; ²Paris Chir. 1917, ix, 690; ³Indian Med. Gaz. 1919, Jan., 17; ⁴Arch. Ophth. 1918, xlvii, 409; ⁵Brit. Jour. Ophth. 1918, Nov., 564; ⁶Arch. d'Ophthal. 1918, xxxvi, 193; ⁷Arch. Ophth. 1918, xlvii, 404.

EYE AND ORBIT, TUMOURS OF.

Friedenwald¹ reports a case of giant-cell sarcoma of the orbit, apparently similar to one published by Flemming and Parsons in 1905. The pathologist, Standish McCleary, remarks that myeloplaxes may, under pathological conditions, be produced by the periosteum. Usually these tumours have a very low malignancy, and the present case had not recurred four and a half years later.

R. Foster Moore, F.R.C.S.

Birch-Hirschfeld,² as the result of an analysis of 75 cases of tumours of the lachrymal gland, comes to the following conclusions. It is often difficult to be certain of the seat of origin of tumours in this region, and many tumours reported under different titles are properly included under the term mixed tumours, and correspond with the mixed tumours which occur in the salivary glands. Histologically they are very complex in structure. They contain cells of an epithelial character, with a stroma which shows at one time myxomatous or hyaline degeneration, at another, islands of cartilage; it is this diversity of structure which accounts for the varying titles under which these tumours have been reported. Parsons believes the tumours are endothelial in origin, whereas the present author believes them to be epithelial. Clinically they are of very slow growth, but they may rapidly take on malignant characters.

A rare tumour of the conjunctiva is described by Casolino.³ A tumour of the superior conjunctival fornix occurred in a woman, causing restriction of movements and proptosis. A Wassermann was positive, and the tumour disappeared with mercurial injections. Four months later another growth appeared under the conjunctiva of the same eye. It was the size of a large bean, of a yellowish-red colour, with a rough surface containing a network of vessels. It recurred after removal, and was found to be a lymphosarcoma.

Arganaraz and Belgeri¹ saw a woman of 28 with a tumour of the iris. The tumour was first noticed nine years previously, but the patient refused to have the eye removed. The tumour formed a round lump about 1 cm. in all directions; it had invaded the cornea and destroyed the iris and adjacent ciliary body. The cells were oval and fusiform, with large nuclei and little protoplasm; there was no pigment.

Weidler⁵ reports a case of spontaneous rupture of the globe from a sarcoma of the choroid. He states that rupture takes place in the centre of the cornea, and that care is required not to mistake these cases for hæmorrhagic glaucoma.

A case of Clapp's⁶ emphasizes, what many surgeons have experienced, that transillumination of the globe as a test for neoplasm, in a case of detachment of the retina, may be fallacious if it is negative. Clapp, finding transillumination negative, did not immediately remove the eye, but on removal later found a melanotic sarcoma.

Hal R. Wright⁷ removed an eye which contained a flat malignant growth of the choroid. Six months later there was recurrence in the orbit of the same nature as that in the choroid. The growth was composed of columnar epithelium, tubular in arrangement, with cysts containing papillomatous growths. It was regarded as a papillary cyst-adenoma, usually classified as non-malignant, and found in the ovaries, breast, and uterus. Wright states there was no history pointing to a primary growth elsewhere in the body; one cannot but feel, however, that one was present.

Ernst Fuchs⁸ contributes an important article on melanomata and sarcomata of the uveal tract. He has first some original observations upon the degree of pigmentation of the retinal epithelium and the stroma of the choroid. The colour of both varies, not with the number of pigment-containing cells—epithelioid cells and chromatophores—but with the amount of pigment contained in these cells. He states that melanomata of the choroid are very rare, and are met only accidentally on anatomical examination. [If looked for clinically, they are not so rare as is here implied.—R. F. M.] They are small; the choriocapillaris is not usually involved; the cells composing them are increased in number, but especially also in size. Fuchs finds no evidence to show that they may develop into melanosarcoma. Fifteen cases of very small sarcomata are given, where the thickness of the tumours did not exceed 1 mm. The paper is a very important one, and should be read in full.

Charles Maghy⁹ records a remarkable case of glioma of the retina. The patient first came under observation when two years old at Moorfields Eye Hospital; she then had a lobulated tumour in the vitreous, which was nearly filled by growth. The eye was removed and was occupied by a growth which almost filled the vitreous chamber; the growth sprang almost entirely from the inner nuclear layer. The second eye, the left, began to give trouble fourteen years later, and was removed eighteen years after the first eye. It contained a typical glioma of the retina. Maghy states that previously no case was on record where the age of a patient with a glioma of the retina exceeded seventeen years; this patient was twenty. Two beautiful coloured plates accompany the paper. Paul Berrisford¹⁰ reviews 41 cases: the most important points are that males are more often affected, 22 to 17; bilateral cases are as 1 to 7. No case was observed after six years of age. Nine cases may be considered as cured—(no recurrence within three years). The importance of cutting the nerve far back is emphasized, as in none of the nine cases of 'cure' had the growth invaded the nerve at the point of section.

Golovine¹¹ adds to his previous work on tumours of the optic nerve. He describes two forms, the intra- and extra-dural, the former arising from the nerve itself, the latter from the sheath. For their treatment the author prefers a route from the outer side, without division of the external rectus muscle. As has often been shown, many of these tumours are benign, and the prognosis as to life is therefore good. The lids are temporarily sutured afterwards.

R. S. Lamb¹² reports a very unusual case of a hæmatoma of the orbit causing proptosis which appeared six months after a head injury.

REFERENCES.—¹*Amer. Jour. Ophth.* 1914, June; ²*Arch. f. Ophth.* 1915, xc; ³*Arch. di Ottal.* 1916, July; ⁴*Bull. d. l. Soc. d. Oftal. d. Buenos Aires*, 1917, iv; ⁵*N. Y. State Jour. of Med.* 1914, Sept.; ⁶*Amer. Jour. Ophth.* 1917, March; ⁷*Ophth. Rec.* 1917, July; ⁸*Arch. f. Ophth.* 1917, xciv, pt. 1; ⁹*Brit. Jour. Ophth.* 1919, Aug., 338; ¹⁰*Royal London Ophth. Hosp. Rep.* 1916; ¹¹*Arch. d'Ophthal.* 1918, xxxvi, 321; ¹²*Ophthalmology*, 1915, April.

EYE, PHYSIOLOGY OF.

R. Foster Moore, F.R.C.S.

Cortical Localization of Vision and of Visual Space Perception.—The Montgomery Lectures on this subject by Gordon Holmes¹ form a very important contribution, not only to clinical medicine and surgery, but also to physiology.

The first lecture is concerned with the cortical localization of vision, with a series of selected illustrative cases given in some detail. In the first place, complete destruction of the area striata of one side is considered, and it is shown that this always results in complete blindness of the corresponding half of the retina in each eye, and that the hemianopia extends right up to the fixation point. In the hemianopias of civil practice, which are usually due to thrombosis or embolism of the posterior cerebral artery, the maculæ are not involved. Holmes's work leads him to believe that the macula, being represented at each occipital pole (*vide infra*), is in a region which is on the borderland of the area supplied by the posterior and middle cerebral arteries, and that if one artery is blocked the other vessel supplies sufficient blood for the needs of the area. Next, cases are given where the lesion was at the occipital pole, and all such cases show destruction of central vision; the centre for the macula, then, is in the region of the occipital pole.

The localization of peripheral vision is necessarily more difficult, for it is concerned with the anterior parts of the striate area, and lesions which involve this area of the cortex almost necessarily damage the optic radiations also. Good reasons, however, are adduced for believing that the upper homonymous parts of each retina are projected in the upper portion of the opposite visual area, and the lower parts of the retinae on the lower parts of this area. The

maculae are represented at the occipital poles, and peripheral vision is situated anteriorly to it; the representation of the intermediate zones of the visual fields, from the fixation point outwards, are probably arranged in this order from behind forwards in the visual cortex.

The evidence that colour perception is localized in these same areas is of two kinds. In the first place, apart from the actual blind areas of the cortex, amblyopic areas are common, and over these areas appreciation of colours is defective; secondly, striking subjective coloured visual phenomena are not infrequently produced by lesions of these areas.

The second lecture deals with disturbances of visual space perception. These observations were carried out on eight men who were suffering from the effects of gunshot wounds which had affected a definite area of the brain; the parts involved were determined in two cases post mortem, and in the remaining six by craniometric observations. The missile had involved the angular and supramarginal gyri, and had passed through the mesial surfaces of the hemispheres immediately dorsal or posterior to the splenium of the corpus callosum. The following were some of the more obvious manifestations of the defects in spacial perception:—

1. There was complete inability to determine the position in space in relation to themselves of objects which they saw distinctly. Thus, when a pocket-knife was held up, the patient looked straight at it, but stretched out his hand in a totally wrong direction when asked to take hold of it.

2. They were unable to determine accurately the relative position of two objects that were at the same time within vision.

3. All were unable to distinguish the absolute and relative size of objects shown them.

4. The inability to localize objects in space caused great difficulty in getting about. Thus, one man, when only a few yards from his bed, started to walk in a totally wrong direction when told to go to it.

5. Another excellent demonstration of very faulty special perception was obtained by putting five or six similar objects on a table and asking the man to count them. This he was unable to do correctly, because he could not appreciate their relation to each other, and so identify those which he had already counted. An interesting analysis of these symptoms, and the interpretation of their nature and significance, completes the lecture.

Factors in Stereoscopic Vision and in the Visual Estimation of Distance.—E. M. Eaton² contributes a very valuable paper on this subject. The visual, physical, and psychical elements concerned are all considered with care, and the paper is clearly the result of much study and thought, and contains many original ideas and observations.

Argyll Robertson Pupil.—J. Dunn³ puts forward some new ideas with regard to the Argyll Robertson pupil; they appear to be based on theoretical views. He believes that the primary response of the pupil to light is a reflex belonging to the autonomic system. He suggests that the rods represent the terminals of fibres from the subthalamic region, and the cones fibres from the anterior quadrigeminal and external geniculate bodies. He further suggests that the Argyll Robertson pupil results from the abolition of the autonomic reflex of the ciliary ganglion.

Inequality of the Pupils.—Stewart Barrie⁴ examined 326 men in whom there was no ocular disease and no disease of the nervous system, as to the frequency of inequality of the pupils. In 35 cases—10.73 per cent—there was indisputable inequality; in 21 cases the left pupil was the larger, and in 14 the right. Inequality of the pupils is a physiological condition in a little over 10 per cent of normal individuals.

The Tonometer.—An excellent article by Priestley Smith⁵ "On Tonometric Values", examines critically a recent important paper on this subject by McLean.⁶

In a later paper⁷ McLean describes his tonometer in detail and the results of his research with it. The instrument itself is based upon the Schiötz instrument, but a number of improvements are introduced. The scale is placed close to the eye, so that it is most easily read. There is no changing of weights, and the intra-ocular tension is read straight off in millimetres of mercury. Numerous details of actual experiments are given, comparing the readings obtained with McLean's tonometer, Schiötz's tonometer, and the actual intra-ocular tension as obtained by a water manometer; all observations point to Schiötz's figures being too low. Tables are given showing readings on the same eye with the manometer, Schiötz's tonometer, and McLean's tonometer. They show how closely the McLean tonometer approximates to the manometric reading, and how much lower is the reading by Schiötz's instrument. The method of testing the tonometer is given in detail. With regard to the normal, McLean says with his instrument the lower limit of intra-ocular pressure is to be considered as 22 mm., whilst he states, "I have not found a normal eye registering above 40 mm."

REFERENCES.—¹*Brit. Med. Jour.* 1919, ii, 193, 230; ²*Brit. Jour. Ophth.* 1919, Feb., 63. ³*Arch. of Ophth.* 1917, xvi, No. 3; ⁴*Brit. Med. Jour.* 1918, ii, 514; ⁵*Brit. Jour. Ophth.* 1919, July, 293; ⁶*Arch. of Ophth.* 1919, 23; ⁷*Brit. Jour. Ophth.* 1919, Sept., 386.

FÆCAL FISTULÆ; WAR WOUNDS OF THE RECTUM AND ANUS.

J. P. Lockhart-Mummery, F.R.C.S.

J. D. P. Tanton and C. Wallace,¹ in a paper on pelvic wounds, give a report on the results of this class of wound in the war. They collected 3719 cases, showing a mortality of 10·37 per cent. Practically all the deaths were due to sepsis. Fistulæ and faecal sinuses were very common. All cases in which there is evidence of intraperitoneal injury call for immediate laparotomy. Immediate colostomy is frequently necessary, and, in addition, if the bladder is injured, suprapubic cystotomy may be required. The general practice during the last year of the war in the English casualty clearing stations was to perform immediate colostomy in cases of rectal wounds, and there is no doubt that many lives were thus saved. In most instances it was possible subsequently to close the colostomy opening.

Lockhart-Mummery,² in a paper on the closure of faecal fistulæ, describes the mistakes that are generally made in attempting to close these openings, and points out the difficulties which may be encountered. He insists on free exposure of the parts by opening up the abdominal cavity to one side of the opening, and then completely freeing the damaged gut before resecting it. The importance of ensuring a good blood-supply to the joined edges when performing the anastomosis is also emphasized. Many of these cases present extraordinary difficulties, and an operation should only be attempted if the conditions are thoroughly understood. Careful preliminary examination with *x* rays, often under an anæsthetic, is advisable, and it is necessary to have a surgeon thoroughly experienced in similar cases. Attempts to close such openings by plastic operations are generally complete failures.

REFERENCES.—¹*Arch. de Méd. et Pharm.* 1918, lxx, 291, 313, 320; ²*Surg. Gyn. and Obst.* 1919, Sept., 312-14.

FÆCES, CLINICAL PATHOLOGY OF.

Oskar C. Gruner, M.D.

To Elucidate the Cause of Obscure Diarrhœa.—Fairley¹ points out that men who have been in Egypt, and suffer from relapses of diarrhœa in this country, may not respond to antidyenteric treatment. In this case the stools should

be searched for *Bilharzia*. The outer portion of stool is taken, especially if there are any tags of mucosa present; it is triturated with saline, and then examined with the low power. The army method² is to mush up the stool with strong brine, and examine the scum.

The Amount of Aceto-precipitable Albumin in the Stool is a Clue to the Degree of Intestinal Dyspepsia. If soluble albumin is present, this is a sign of grave disturbance, up to ulceration. If blood is also present, the case should be regarded seriously (Labbé and Canat³).

The Presence of Urobilinogen is to be considered, according to the recommendations of Salomon and Charnasz.⁴ In cases of cancer the amount is greatly reduced. In cases of ulcer there is no noteworthy change. Researches on urobilin in fæces have gone to show⁵ that it is a measure of the blood-pigment received by the liver; that is, of hæmolysis in the blood. Hence it provides a means of distinguishing between pernicious anæmia and anæmia secondary to hæmorrhage or cancer. But Whipple and Hooper⁶ show that the amount of bile pigment is not proportional to hæmolysis, because different diets will have different effects on the amount of bile excreted. O. H. Robertson⁷ considers the amount of urobilin in the stool to be a sure index of blood destruction.

The Presence of Blood.—Thévenon and Rolland⁸ use a 5 per cent solution of pyramidon (see STOMACH, FUNCTIONAL EFFICIENCY TESTS). Gregersen⁹ recommends the following modification of the benzidin test: A scrap of fæces, the size of a hemp-seed, is spread out into a thin layer on a slide, and 2 to 4 drops of the following reagent are dropped on: 2.5 cgrms. benzidin, 20 cgrms. barium peroxide, and 5 c.c. 50 per cent acetic acid. If a green-blue or pale blue appears in 15 to 60 seconds, it means 0.2 to 1 per cent of blood; if a livelier blue appears in 3 to 15 seconds, it means 1 to 5 per cent; and if a darker blue appears at once, it means over 5 per cent. But Bogason¹⁰ finds that swallowed purulent sputum will give a positive benzidin test.

The Presence of Tubercle Bacilli.—A recent modification¹¹ is to mix a morsel with distilled water, and add ether in an Esbach tube. After shaking well, and allowing the corpuscles to sink, the extract is centrifuged and the sediment dissolved in a little ether and spread on a slide (T. Schram).

REFERENCES.—¹*Quart. Jour. Med.* 1919, xii, 391 (esp. p. 401); ²*Jour. Amer. Med. Assoc.* 1918, lxxi, 1557-1561; ³*Bull. de la Soc. Méd. des Hôpitaux*, Paris, 1918, xlii, 659; ⁴*Deut. med. Woch.* 1917, No. 50; ⁵*Jour. Amer. Med. Assoc.* 1918, lxxi, 1061; ⁶*Amer. Jour. Med. Sci.* 1918, clv, 562; ⁷*Arch. Int. Med.* 1915, xvi, No. 3; ⁸*Presse Méd.* 1918, xxvi, 425; ⁹*Ugeskrift f. Læger*, 1918, lxxx, 691, 733; ¹⁰*Ibid.* 582; ¹¹*Norsk Magazin f. Lægevidershaben*, Christiania, 1918, June, 661.

FAVUS.

E. Graham Little, M.D., F.R.C.P.

Transmission from Mice to Man.—Lawrence and Paul described an epidemic of favus in man which was traced to handling wheat stored in Australia. The wheat had accumulated during the War owing to difficulties of export, and had been attacked by mice, among which a rapidly fatal epidemic of skin disease had broken out. This disease was proved by Lawrence to be *Favus Quinckeanum*. Quantities of this wheat have recently been imported into the States, and Buchanan¹ conducted an investigation into the possibilities of importing mouse favus into the States by this means. Careful examinations of the remains of two mice found in one of the samples in Washington showed the presence of 'hyphæ' in too poor condition to enable cultures to be made, and experimental inoculation proved ineffective. Buchanan concludes that desiccation destroyed the infectivity.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, Jan. 11.

FEET, SURGERY OF.*Sir W. I. de Courcy Wheeler, F.R.C.S.I.*

Köhler's Disease.—Isolated disease of the tarsal scaphoid was first described in 1908 by Köhler, who reported three cases. C. McClure,¹ Maynard Smith,² and Cockayne³ describe cases of this condition. The etiology is obscure. Many think the disease inflammatory, but disagree upon the nature of the inflammation. Pfahler considers the condition as an osteitis, probably traumatic or rheumatic, which interferes with development. It may appear in the absence of syphilis or tuberculosis. Hetzel likens it to osteochondritis juvenilis in the hip (q.v.). Radiography shows a scaphoid smaller than normal, irregular in outline, often denser, and with no distinction between the cortex and the spongy portions (see Fig. 14). The patient limps, though pain is not



Fig. 14.—Köhler's disease. Skiagram of both feet taken at first examination, the right or diseased foot being shown at the left.

a marked feature of the disease. 'Locally there is slight swelling over the scaphoid and some tenderness, but no discoloration. It is difficult to exclude trauma as a cause in children. McClure obtained a cure of the condition, with restored development of the scaphoid, after five months' fixation of the foot in plaster, and Maynard Smith after six months. Cockayne describes a case in a cretin $4\frac{1}{2}$ years old.

The condition should be kept in mind in certain cases of flat-foot with swelling, and before making a diagnosis of tuberculous mischief.

Deformities of Feet.—E. Rich⁴ advocates a method of accurately recording the degree of static defect in a foot: this includes (1) a pedograph made by coating the foot with a ferric chloride solution, and 'developing' the impression it makes by painting it with an alcoholic solution of tannic acid. While the foot rests upon the paper, its contour is outlined with a pencil (see

Fig. 15), guided by a vertical support. (The contour is that of the *upper* portions of the foot). The first base-line, M L, is now drawn forwards from a

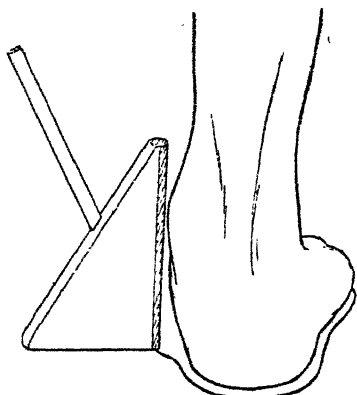


Fig. 15.—Perpendicularly drawn contour line of upper foot. 'Travis block' is serviceable in maintaining a perpendicular while describing the contour line.

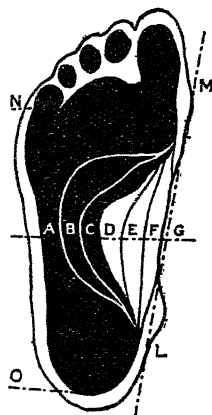


Fig. 16.—Scheme of pedograph interpretation: On second base-line the point D (half the distance from A to G) marks the width of the normal impression. The space AD is subdivided into three sections to represent the impressions of the three degrees of cavus. The space DG is likewise subdivided to represent impressions of the three degrees of flat-foot.

point just behind the outline of the internal malleolus to make a tangent with the contour at the first tarso-metatarsal joint (*Fig. 16*). The second base-line, A G, bisects the distance between two lines each drawn at right angles to the foot-axis, one at the base of the little toe and one at the heel. The base-lines intersect at G, and the second base-line cuts the normal impression halfway between the outer line of the contour and the intersections of the base-lines. The pedograph

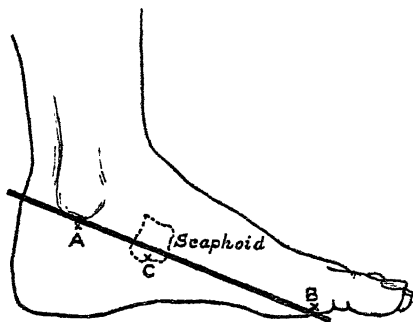


Fig. 17.—Arch scale for the height of scaphoid called the Feiss line. Normally the tubercle is one half-inch below the Feiss line.

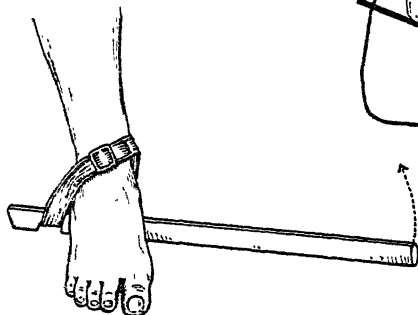


Fig. 18.—Application of Schapps lever for forcible correction of fallen longitudinal arch; protective towel and felt not shown.

alone is useless, for a fat-pad, which sometimes persists till the age of thirty, may fill up the arch. In fat subjects without skeletal change, the imprint may be extensive. Similarly, the

imprint of an emaciated foot will simulate pes cavus. A flattening of the longitudinal arch giving an impression extending inwards to G would be maximal. By trisecting DG at E F, three degrees of flattening can be recorded, according as the inner border of the pedographic impression cuts the outer, middle, or inner third of DG at B and C. Degrees of pes cavus can be similarly recorded by trisecting A D.

(2) The second requisite is the relation of the lower border of the scaphoid to a line which is marked out by making the lower edge of a ruler a tangent to the lowest part of the external malleolus and also to the plantar skin opposite the first tarsometatarsal joint (Feiss's line). (Fig. 17). Normally the lower scaphoid border should be half an inch below this line. Rich's paper also figures a lever for forcible correction of flat-foot; this can be easily improvised in case of need from a notched wooden bar and a bandage (see Fig. 18).

H. Keller⁵ finds that flat-foot is an early sign of tabes dorsalis due to muscular hypotonicity. The feet, too, tend to be abducted in an unconscious effort for stability, and the flattening of the arch is thus increased. He thinks the foot, with its many joints and bursæ constantly exposed to strain and stress, may often be the first organ to bear the brunt of a systemic infection. In obscure conditions of the feet it is therefore necessary to search the mouth, nose, feces, urine, etc., for an infective focus. Feet which are merely weak, and therefore painful, are relieved by rest in bed, while a toxæmic arthralgia will be at its worst about 4 a.m.—perhaps because of sluggish circulation.

Hallux Valgus.—Deaver⁶ finds that people with short toes are seldom troubled with bunions. When the second toe is longer than the first, all the toes are proportionately long, and the foot slender. Feet of this type are specially liable to bunions. He emphasizes the importance of not injuring the inner aspect of the outer wall of the joint in arthroplasty, because of the liability to post-operative neuralgia along the

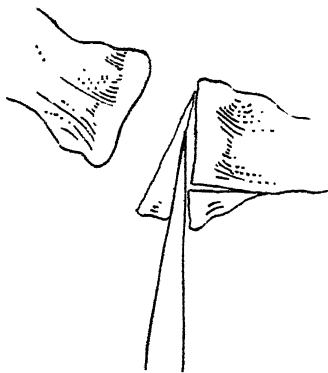


Fig. 19.—Hallux valgus. Rough's operation: top view.

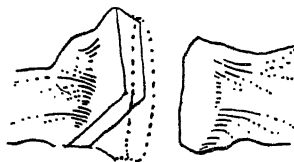


Fig. 20.—Hallux valgus. Rough's operation: lateral view.

anterior tibial nerve which supplies this region and sends a twig to the joint. He notes the slight but inconvenient tendency to dorsiflexion of the great toe after operation, and corrects it, not by mere division of the extensor longus tendon—which he thinks causes the toe to dip and interferes with the natural gait—but by division and suture of the tendon to the proximal phalanx.

Rough describes an operation which he claims renders ankylosis practically impossible. Sufficient of the metatarsal head is removed to allow straightening of the great toe (as in Fig. 19). The inner sharp and hypertrophied corner is

next removed. The epiphysis is then shaped as in *Fig. 20*, and the usual flap inserted between the bony ends.

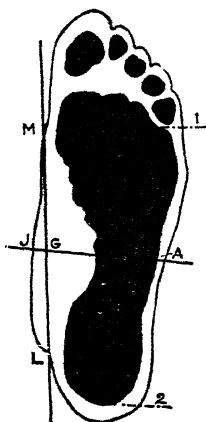


Fig. 21.—Ankle valgus. No fat present. Note that the inner contour line of the upper foot passes outside the first base-line between L and M.

Ankle Valgus.—According to Rich,⁴ radiography shows that this condition of so-called 'foot-pronation' is in 80 per cent of cases due to abnormal play in the ankle-joint itself, and not, as is generally held, in the tarsus. The valgus may persist from childhood, or follow injury to the internal lateral ligament. The pedograph makes the condition evident. The contour of the inner side of the foot and ankle tends to overspread the first base-line (see *Fig. 21*). Curiously, he finds ankle valgus more commonly associated with pes cavus than with flat-foot. The weight should be deflected from the inner side of the foot by a piece of leather $\frac{3}{8}$ in. thick attached to the sole of the boot just behind the head of the first metatarsal bone. The inner side of the heel should also be lifted.

Jones has called attention to ankle valgus and spurious flat-foot from spasm of the peronei muscles. The condition can be cured by resection of a portion of the peronei tendons (not tenotomy).

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, Oct. 26, 1360; ²*Lancet*, 1919, ii, 832; ³*Ibid.*, 1919, Dec. 13; ⁴*Jour. Amer. Med. Assoc.* 1918, Dec. 14; ⁵*Med. Record*, 1918, Oct., 673; ⁶*Western Medical News*, 1918, Sept., 193.

FILARIASIS.

Sir Leonard Rogers M.D., F.R.S.

J. G. Forbes¹ reports two cases of *Filaria conjunctiva* met with in Macedonia, together with the first discovery of the male worm, which was identified for him by Leiper. The latter was obtained from a small lump in the forearm by operation. In the other case the tumour occurred on the right side of the nose. Neither case showed any microfilariae in the blood. Illustrations are given. F. G. Rose,² working in British Guiana, has treated 60 persons with Auto-genous Streptococcal Vaccines, one dose of 100 and two of 200 million with fortnightly intervals; 19 were of fairly long standing—one year or more—of whom 9 have had no recurrences after six months and upwards, and in the rest they have been milder. None of the shorter cases have yet relapsed. The œdema, even of considerable duration, tends to disappear. [The writer has used this method for several years past in a few cases, with promising results—L. R.]

A. K. R. Chowdhury³ records a number of leucocyte counts, and found 9 to 20 per cent of eosinophils and an average of 12 in twelve cases uncomplicated by intestinal worms, while in three they were not increased. During an attack of filarial fever the total count and the polynuclears increased and the eosinophils decreased, which he thinks supports the view of Rogers and Sampson Handley that the fever is due to a secondary bacterial infection. R. Bryson⁴ illustrates a very large elephantiasis of the vulva of ten years' duration.

REFERENCES.—¹*Lancet*, 1919, i, 654; ²*Jour. Trop. Med. and Hyg.* 1919, May 1, 81; ³*Calcutta Med. Jour.* 1919, Feb., 215; ⁴*Ind. Med. Gaz.* 1919, June, 220.

FLYING, MEDICAL ASPECTS OF.

G. A. Sutherland, M.D., F.R.C.P.

SELECTION OF CANDIDATES.

Owing to the great progress of aviation and the number of flying men called for, the medical practitioner has now to acquire such a knowledge of the physical requirements of candidates as to be able to advise parents of the suitability

of their sons for this pursuit. At present all candidates—whether for civilian or service work—have to pass the examination of the Medical Board of the Royal Air Force. Certain features of this examination, as described by Sutherland,¹ may serve as a guide to the general practitioner who is consulted on the subject. A good candidate must have a sound physique and be free from organic disease; his previous health record must be satisfactory; he must be free from any constitutional or acquired disability which has rendered, or may render, him liable to attacks of loss of consciousness, or of vomiting or fainting; and he must possess, more especially, a functionally strong nervous system, cardiovascular system, and respiratory system. These requirements are not demanded on empirical grounds; they are the result of experience gained when no special medical examination was made. For example, it was found that a youth who had been subject to asthma as a child would tend to suffer from a recrudescence of this trouble under the stress of flying. It was found that a man liable to train or tram sickness would probably suffer from incapacitating air-sickness. It was common to find that the subject of a previous nervous breakdown broke down again early in his flying career. The great importance of a functionally strong nervous system and cardiovascular system is thus emphasized. Stability of these systems is required in the learner so that he may acquire the art of flying in such a way that it becomes automatic and unconscious—like a boy propelling a bicycle, or a good rider's management of his horse. Control of these systems is also demanded, so that decision in action and in emergencies may be prompt and wise.

The medical requirements for the air service are fixed on these lines. It is more difficult to decide as to the possession of all these requirements at a medical examination, and more especially to decide on a pass standard—for supermen amongst the candidates are few and far between. The examination from the surgical and the medical point of view is carried out so as to determine as far as possible the functional efficiency of the important organs. Tests are employed for this purpose, and the results of these tests are carefully compared. For instance, Mr. Arthur Cheatle has devised a series of tests of nervous tone and stability. These comprise walking on a line, balance on quick turning, balancing an object held at arm's length, standing still on one foot, etc. When a candidate fails to pass these tests successfully, it is found that other signs of nervous instability will usually be present also—for example, tremulousness, dilated pupils, exaggerated knee-jerks, etc. So that the examiners, in summing up, are influenced in their decision by the proof of a definite general disability rather than by any one test.

Both in this country and abroad the physiologist and the psychologist have come to the assistance of examining medical boards. Colonel Martin Flack² has, in a series of papers, described numerous physiological tests bearing on the condition known as 'oxygen-want', and on 'physical efficiency'. Amongst the latter he considers the response of the pulse to exercise. In a good subject, after a regulated amount of exercise, the increase in rate is about 20, and the time of return to normal is 15 to 25 seconds. If the time of return exceeds 30 seconds, it is suggestive of cardiovascular inefficiency. The length of time a man can hold his breath is considered a test of his resolution, and also of his condition as regards oxygen-want. By means of a U tube filled with mercury he tests the respiratory force.

The tests for oxygen-want have been developed and emphasized very much in America.³ At the Medical Research Laboratory the first place in the examination is given to the determination of the candidate's immediate compensatory reaction to oxygen deficiency. This is based on the generally-accepted view that the aviator's trouble in high flying is dependent, not on the lowered

barometric pressure, but on the diminished amount of oxygen in the air. The strain imposed by altitude was found to be closely similar to that induced by extreme physical exertion. In both conditions oxygen deficiency occurs; but at high altitudes and in an aeroplane, the effects are the more subtle and dangerous, because of the lack of the stimulation to breathing and the other functions which increased carbon dioxide production affords during muscular exertions. For the same reason low oxygen, used with discretion in low-pressure chamber or re-breathing apparatus, affords a conclusive test, clearer and more simple than any of the conventional forms of physical exercise sometimes employed in internal medicine as aids to examination of the heart. Such are the claims made. Further experience leads the investigators to believe that these tests will reveal those qualities which are known as 'condition' or 'training' in the athlete; or its opposite, the lack of compensatory power equivalent to being 'out of training'. In its more extreme forms it is identical with 'a weak heart'. They offer the hope that this test may develop into that long-sought and greatly-needed aid to cardiovascular diagnosis, a means of testing and measuring the 'functional power of the heart'. We are dealing now with American views and hopes, but it may be pointed out that Colonel Flack has been testing on the same lines for some years, and that his methods were also directed to the determination of physical efficiency.

The candidates were tested either by the **Henderson re-breathing apparatus**, or in a large steel chamber, capable of holding six or eight men at a time, in which the air-pressure and supply could be regulated. The test with the Henderson re-breathing apparatus occupies from 25 to 30 minutes. As the oxygen in the air inhaled from the apparatus is reduced, the candidate is virtually elevated to a corresponding altitude. If the man is even slightly below the best of physical condition, the altitude to which he is safely taken is distinctly reduced. A cold, indigestion, late hours, or worry may reduce his resistance temporarily, by many thousand feet. A good respiratory response to the gradual decrease in oxygen is shown by a slight increase in the depth and rate of breathing. If this response fails as the percentage of oxygen diminishes, fainting and unconsciousness quickly follow. A good response as regards the circulation is a total increase of from 15 to 40 beats in the heart-rate in the course of half an hour, during which the oxygen is lowered to between 7.5 and 6.5 per cent. Failure to respond in this way is associated with poor toleration of low oxygen. An excessive acceleration in the heart-rate of from 50 to 70 beats throws too great a burden on the circulatory mechanism, and occurs only in men who do not tolerate well low percentages of oxygen. It was recognized, however, that not single changes only, but the interplay of all the compensatory factors when man ascends quickly to high altitudes, and remains there only a short time, must be studied. It was found in the case of men kept in the pneumatic chamber under low oxygen for an hour or two, that two of the compensatory changes, those in the breathing and the circulation, appeared almost simultaneously, and increased steadily with the gradually increasing altitude. When the desired altitude was reached, 15,000 to 20,000 feet, the breathing continued either at the depth it had acquired during the period of progressive change, or it became still deeper for a time. The pulse-rate, which gives an index of the increase in the rate of blood-flow, increased during the period corresponding to ascent, and, when the altitude was fixed, remained constant or, in some of the men, slowed slightly. This slowing of the pulse was so frequently observed that the investigators sought some explanation, and found it in the fact that other compensatory factors were at work in relieving the heart. Their conclusions were that during short exposures to low oxygen or high altitudes, such as the aviator experiences, the

compensatory reactions of the body to a decreased oxygen supply are made almost entirely by the circulation and by the breathing, and it is on these that the aviator must depend.

These conclusions are much the same as those arrived at by the Medical Board in this country, save that nervous control and stability were also considered of the first importance here. It is another question whether candidates should be accepted or rejected on these tests with the re-breathing apparatus. It is a mechanical test, and open to several fallacies; it is very artificial as compared with the natural element in which the aviator will practise; it does not allow for the adaptability of the human organism to novel surroundings; and it might lead, as hinted at above, to a candidate's rejection from oxygen-want, the result of dining out the night before his examination. We are reminded of Sir James Mackenzie's dictum that "the next thing the discoverer of a mechanical device must do after he has recognized its use in clinical medicine, is to get rid of it in practice". The results obtained by instrumental means should, if possible, be made available by ordinary clinical methods.

The psychologist, in his efforts to help in the selection of flying men, brings into use a number of complicated instruments and a terminology which the ordinary examiner has some difficulty in following. In France, candidates were tested as to their reaction time and the measure of their emotional response. By means of the d'Arsonval electric chronometer, the reaction time, auditive and tactile, could be measured in one-hundredths of a second. Dr. Jules Voncken⁴ considers that experience has shown that little reliance can be placed on these tests. In America, the psychologist has an important place in the observation of the candidate who is being tested for oxygen-want. By means of a special apparatus he notes the composure and attention of the reactor, and his comprehension of the instructions given. His motor tendencies are recorded in a fixed scale of types. The beginning of the effects of oxygen deficiency on attention and co-ordination are carefully watched for. The final moment of 'complete inefficiency', which will be followed very quickly by a complete breakdown and unconsciousness, is first recognized by the psychologist, whose presence seems necessary for the preservation of the life of the candidate in the 'altitude test'.

DISORDERS AND DISEASES OF AIRMEN.

The fullest and most complete account of aviation from the medical standpoint will be found in a book by H. Graeme Anderson.⁵ It has proved in war flying, as in warfare generally, that the psychology of the combatant is a subject of the first importance. The word *aero-neuroses* has been coined to express the flaws in the airman's psychic state which have been brought to the surface by means of flying, or by accidents or injuries while flying. When studied, however, these do not differ from the cases of 'neurasthenia', 'shell shock', etc., which have been so common amongst terrestrial fighters. It was probably the stress of air warfare and the prolonged continuous service, owing to the shortage of pilots, which led to the large number of these cases; the youthful flyers having been compelled to bear a greater burden than ordinary medical prudence would have put on them. It is to be hoped that in the future the flying man will be trained and tested with at least some of the care and sympathy which attends the training of a racehorse. Anderson also deals very fully with the surgery of aviation. Surgical work differs but little from that met with in military and civil life. The chief difference lies in this, that in aviation work the surgeon is called on to deal with the results of high velocity accidents associated with falls at varying angles and from varying heights.

graphs here included are reproduced (*Plates XIV, XV*), and show better than a description the condition indicated. The pitted atrophy of limited portions of the skin, usually over the malar bones, preceded by erythema in several cases, and also by comedo formation, make a picture of disease very striking and characteristic. All the cases recorded began in early life long before acne vulgaris becomes a possible diagnosis. Both of MacKee's cases were Jews, and both showed some evidence of systemic tuberculosis. A careful histological report of tissue from the two cases shows acanthosis of hair follicles, horn cysts throughout the derma derived from hair follicles; inflammation, degeneration, and retraction of connective tissue; underdevelopment of sebaceous glands; and unimportant changes in the epidermis, such as absence of rete pegs.

Graham Little² records a new instance of this disease in a boy, of Irish parentage, otherwise in excellent health, with a condition of reticular atrophy of the skin over the malar bones, dating from the age of ten, with a few comedones, but no erythema at the time of seeing him, five years after commencement. There was no suggestion of tuberculosis or other illness.

REFERENCES.—¹*Jour. Cutan. Dis.* 1918, June, 339; ²*Brit. Jour. Dermatol.* 1919, Oct., Dec., 201.

FRACTURES, UNUNITED. (*See UNUNITED FRACTURES; AND ELECTROTHERAPEUTICS, p. 28.*)

GALL-TRACTS, SURGERY OF. *E. Wyllys Andrews, A.M., M.D., F.A.C.S.*

The chief interest of surgeons at present is how to prevent recurrences after operations on the gall-tracts. As our cases are followed up after operation, it is very discouraging to see how large a percentage are not cured. The first point to be considered is, that operations on early cases yield a very much higher percentage of cures. Deaver¹ urges earlier operation, and states that gall-bladders once infected will never get well. [We do not concur in this. A great many people have one or two attacks of cholecystitis and get entirely well. In our opinion it would be unjustifiable to operate on all cases. However, we believe that internists should set a limit to expectant treatment, and send them to the surgeon earlier. Pericholecystitis with the resulting adhesions, which deform the pylorus, duodenum, and transverse colon, are well-nigh incurable. Removal of the gall-bladder is difficult and dangerous, and the adhesions soon re-form and cause severe digestive disturbances. Pancreatitis is another complication resulting mostly from neglect, and its importance is becoming increasingly more evident.—E. W. A.]

Re-formation of calculi is another factor in recurrences (Jacobsen²). [We do not believe that overlooked calculus is as common as the former.—E. W. A.] To eliminate this possibility we should (Judd³): (1) Remove the cystic duct far down near the choledochus; (2) Always probe a dilated common duct (Eisendrath); (3) Use absorbable ligatures, so as not to leave a nucleus for new stone formation. Dilated common ducts usually mean stones in the distal end, and often these cannot be palpated through the pancreas.

Wessel⁴ mentions another serious result of neglect. He claims to have demonstrated conclusively that cholecystitis is always accompanied by achylia gastrica, and that this is the cause of the digestive disturbances. If it is allowed to go on, a gastritis develops, and atrophy of the mucous membrane and permanent achylia result. [This does not correspond to our experience; but if it does prove to be true, it is a most important contribution.—E. W. A.]

Brown⁵ has cultured 70 gall-bladders, and grown streptococci from the walls of 75 per cent of those showing extensive pathological changes. These organisms, and also those cultured from the tonsils of the same patients, have a marked

PLATE XIV.

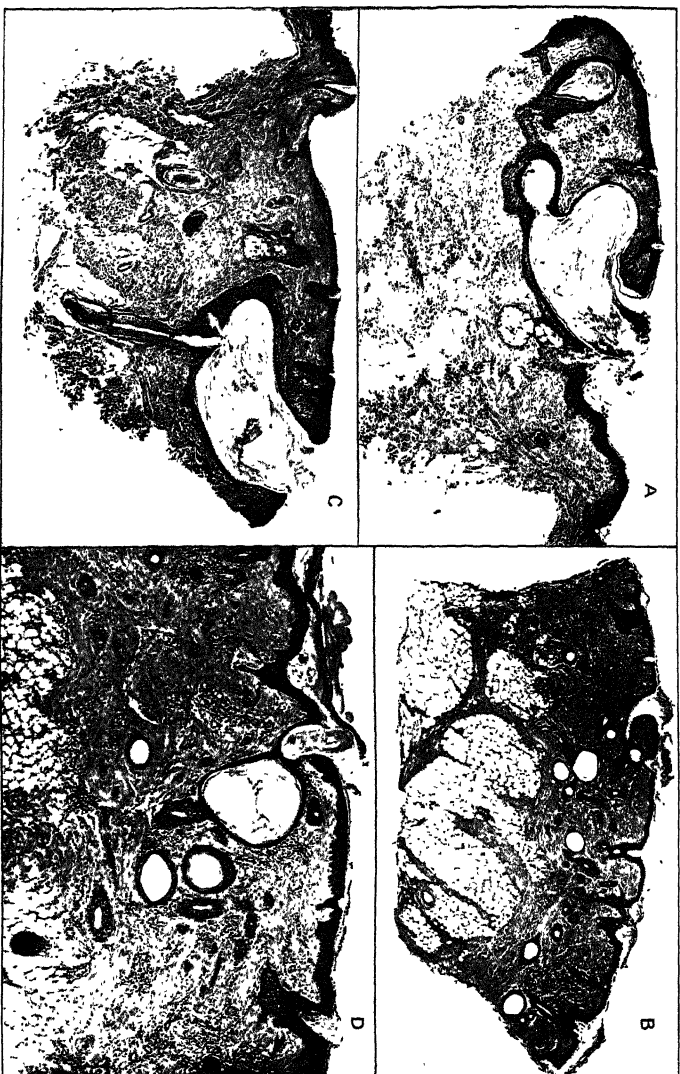
FOLLICULITIS ULERYTHEMATOSA RETICULATA

(GEORGE MILLER MACKEE, M.D.)



Photographs by the kindness of George Miller Mackee, M.D., New York.

PLATE XV.
FOLLICULITIS ULERYTHEMATOSA RETICULATA—continued



selective affinity for the gall-bladder when injected intravenously. As shown by Rosenow,⁶ we must admit that cholecystitis, at least in many cases, is a blood-borne infection, and removal of the focus should be a routine part of the treatment. It may prove to be of much value in preventing recurrences.

Wilenski and Rothschild⁷ have shown that the cholesterin content of the blood is not diminished by cholecystectomy, except in those cases where it was very high before operation, due to common-duct obstruction. Prolonged drainage of bile from a cholecystostomy will lower it considerably, and they advise this in cases where the gall-bladder is not too extensively damaged. [We would suggest that diet can accomplish the same thing in cases where cholecystectomy is more desirable.—E. W. A.]

As regards the choice of operations, most surgeons are now resecting the gall-bladder in all cases showing any pathological changes in the walls; these seem to average about 80 per cent. When the gall-bladder has normal walls, but contains many stones, resection is advisable. With one large stone, drainage is sufficient. Care should be taken to palpate the pancreas and be sure that it is not diseased before doing a cholecystectomy, because this deprives us of our only method of drainage in these cases.

See also x-ray diagnosis in connection with gall-stones (p. 17, 23).

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1919, June, 735; ²*Amer. Jour. Obst.* 1919, Jan., 32; ³*Ann. Surg.* 1918, lxvii, 473; ⁴*Jour. Amer. Med. Assoc.* 1919, Jan. 4, 82; ⁵*Arch. Internal Med.* 1919, Feb., 185; ⁶*Jour. Infect. Dis.* 1916, xix, 327; ⁷*Amer. Jour. Med. Sci.* 1918, Oct., 564.

GAS POISONING.

Herbert French, M.D., F.R.C.P.

Pulmonary After-effects.—Soldiers and others who have recovered more or less from the immediate effects of gas poisoning, very frequently indeed have persistent symptoms of disability for which no physical cause can be discovered on examination; and there can be little doubt that a percentage of such cases suffer from purely functional symptoms, similar to those that result from fright or from emotion, as distinct from commotional shell-shock. Their tendency to rapid breathing, to rapid heart-beat, to shortness of breath or actual dyspnoea, may strike one at the time as being due to an organic cause; but other features of the case, and the state and behaviour of the patient under different circumstances, ultimately convince one that he is a sufferer, not in his lungs or heart, but in his central and sympathetic nervous system. The great difficulty is to make sure in picking out these purely functional cases from those which have organic changes in their respiratory passages or lungs to account for their cough, their thoracic pain, or their shortness of breath; and there is no rule by which one can decide with certainty. At the same time, when one has seen the extent of the destructive lesions in the respiratory passages and lungs in fatal cases, it would be too much to suppose that amongst those who have suffered, but have not died, there have been no organic disturbances, and no possibility of persistent after-effects from the changes in the bronchial tubes and lung tissue which result.

One has not yet had an opportunity of seeing these after-effects under the microscope, but it is likely that in some cases at any rate bronchial tubes that have had their mucous membrane destroyed remain as raw surfaces, analogous to the raw surface of the bowel that dysentery may cause; others have a state of lungs in which parts at least have had many interalveolar walls destroyed, throwing many alveoli into one, and causing a state of more or less emphysema, patchily distributed no doubt, but *in toto* sufficient to cause the same kind of disability as results from emphysema arising from other causes: though more difficult to diagnose with certainty, because enough time has not elapsed for the chest wall to lose its motility and for the more obvious signs of

emphysema to have accrued. Large numbers of such cases will come under treatment for years to come; it will be for each medical man to come to a conclusion, on each individual case, whether the chest symptoms are nervous in origin, or due to real defects in tubes or lung tissues; and later we shall know more about these chronic pulmonary after-effects of gassing than we do at present. Already there are published opinions upon the subject, and amongst them is a useful paper by Ramond and Guillaume,¹ who worked under the Gas Clinic of Professor Achard in France. These observers classify the clinical forms of real respiratory after-effects of gassing into six groups, basing their observations upon a careful study of 162 cases selected as being of organic nature from amongst a much larger total of cases suffering from the after-effects of gassing. Their six groups were as follows: (1) Those suffering from recurrent simple bronchitis; (2) Emphysema in addition to bronchitis, together with the tendency to emphysema-like attacks; (3) Recurrent congestive oedema of the bases of the lungs; (4) Delayed pulmonary abscess, the abscess not becoming apparent sometimes for months after the gassing itself; (5) True pulmonary tuberculosis; (6) Cases simulating phthisis, but never showing tubercle bacilli, and labelled by them 'pseudo-tuberculosis'.

Group 1.—Of the 162 patients, 27 were sufferers from simple and recurrent bronchitis, relatively mild and without fever; characterized by the presence of sonorous or sibilant rhonchi over the greater part of the chest, bouts of coughing, and mucopurulent expectoration, sometimes small in amount, sometimes considerable. Attacks of this kind would come on without any cause that would be adequate in an average individual: such, for example, as breathing a smoky atmosphere, or breathing cold air immediately after being in the warm. As a general rule, the bronchitic bouts would last a week or less, but the frequency with which they recurred constituted a real infirmity to the man. In 1 case this kind of thing had been going on repeatedly for twenty months; in 3 cases for more than a year; in 8 for more than six months; and in the remainder for varying periods up to four months.

Group 2.—The second type, diagnosed as emphysema in addition to bronchitis, suffered from dyspnoea in addition to the symptoms complained of by Group 1. This dyspnoea was present to a slight extent almost all the time; was increased upon exertion, and occasionally, even without apparent cause, accentuated to such severity that a bout of asthma was simulated more or less. These symptoms were presented by 31 cases; 10 having had them for more than a year persistently; 11 for more than six months; 10 for more than two months; and none showing much alleviation as months went by.

Group 3.—These cases, in which recurrent congestive oedema of the bases was the most marked feature, were men in whom an attack of bronchitis might seem to be on the high road to complete recovery, the temperature having been normal for several weeks, and auscultation showing only an occasional rhonchus here and there in the lungs; when suddenly, without apparent cause, the temperature would rise again to 100° or 101°; dyspnoea would reappear, accompanied by pain in the chest, and always by an abundant expectoration of frothy fluid, occasionally tinged with blood; whilst at the same time at one base or at both, and sometimes for a considerable distance up the back, râles and moist sounds would be heard suggesting congestive oedema of the lower parts of the lungs rather than generalized bronchitis. In some of these cases the signs, instead of being symmetrical or bilateral, would be confined more to a particular spot, and remain there for a long time; though one could not diagnose actual consolidation. As a general rule the exacerbation in itself would last something like five to eight days; but at the end of one or two or several weeks it would reproduce itself again, and go on doing so with a

deplorable persistence, the number of such relapses rising ultimately to a high figure, and showing little or no sign of stopping. It was not uncommon to find four, five, or even twelve such exacerbations during a five-months stay in hospital, by which time the patients would be sent elsewhere and their future progress lost sight of. There were 21 cases of this type amongst the 162 studied.

Group 4.—The authors were impressed by the infective character of some of the cases just described, as if the type might sometimes be a stage just previous to the development of actual pulmonary suppuration—an intermediate stage which might or might not go on further. Two of the patients were watched, one for four months and the other for seven, and no tubercle bacilli could be found in the sputum; and yet the temperature, instead of becoming normal, oscillated up and down irregularly, and this pyrexia was accompanied by loss of weight, an earthy complexion, persistent râles at one base, with impaired note, so that a small local empyema was not unnaturally suggested. In these two cases the empyema, if present, was not found; but they serve to form a connecting link between the less severe cases of Group 3 and those of the present group, in which either an abscess or a small local empyema was ultimately demonstrated. It might not be weeks, but actually several months, after the gassing before the purulent focus became recognizable; but it was verified in 7 cases, either by surgical intervention or by autopsy. The authors comment particularly upon the slowness with which the pus in the chest becomes recognizable.

Group 5.—Of actual pulmonary tuberculosis, verified bacteriologically, their opinion is that the development of this after gassing is extremely rare. They saw no case of acute generalized pulmonary tuberculosis amongst their patients, and only 2 in whom the subacute or chronic type of the disease became manifest; and in both of these the existence of phthisis previous to the gassing was known.

Group 6.—There was, however, a type of case which these authors have labelled 'pseudo-tuberculosis'. There were 17 such cases. In none of these, even after repeated examinations, could any tubercle bacilli be found in the sputum; but in all there was persistent loss of weight; more or less pyrexia persisted, irregular and not extreme, lasting for weeks and months; auscultation would demonstrate râles suggestive of bronchitis, with perhaps a greater predominance of these signs at one or other apex; and there might also be an impaired apical percussion note; the patients were ill, and remained in the hospital for months without becoming cured, yet without developing signs of any progressive lesion, and without tubercle bacilli ever being found in the sputum. This is a type of case in the treatment of which difficulties may arise in general practice; for, though apparently not tuberculous, they seem to remain persistently ill, or at any rate not well, in much the same way as subacute or chronic phthisical cases.

TREATMENT.—The authors do not give the treatment adopted in these post-gassing cases, and it will be interesting to learn whether they benefit from antiseptic inhalations or from vaccine therapy, or whether special climatic treatment has to be adopted for them. In so far as microbic infection of the respiratory passages probably plays some part in the persistence of their symptoms, **Vaccine Therapy**, as discussed under **NASAL CATARRH**, may prove of material assistance to the individual; but if in addition—as must surely be the case in at any rate some instances—there is a persistent rawness of the lining membrane of the respiratory passages, from which the mucosa may be partly or wholly denuded by the effects of gas, lines of treatment directed against microbic infection are likely by themselves to be unsuccessful.

¹REFERENCE.—*Presse Méd.*, 1919, Aug. 18, 477.

GASTRO-INTESTINAL DISEASES. Glucose as a substitute for saline solution (*see p. 7*). Importance of electro therapeutics in gastropotosis (*see p. 18*) and in other gastro-intestinal conditions (*p. 20-24; and 29*).

GENERAL PARALYSIS OF THE INSANE. *Bedford Pierce, M.D., F.R.C.P.*
Marguerite Wilson, M.B., Ch.B.

ETIOLOGY.—Henri Colin¹ pointed out that under war conditions the course of general paralysis was exceptionally rapid, and suggested that some other factor besides the infective organism was important. He did not consider that this was alcoholic indulgence, but attributed it to the mental and physical strain of active military service. Extreme fatigue and emotional disturbances appeared to accentuate and accelerate the toxic infection. This opinion was corroborated by Maxwell Ross,¹ who had seen a large number of young men, many of them about twenty-six years of age, suffering from general paralysis, who presented a history of recent syphilitic infection. Many of these cases went down-hill rapidly, and death occurred early in the course of the disease.

Browning and Watson² state that most of the so-called parasymphilitic affections in which the symptoms are delayed and intractable occur in patients giving a history of very slight general lesions.

There is still much uncertainty respecting the etiology of general paralysis, in spite of the discovery of the spirochæte in the cortex of persons dying of this disease. It is difficult to understand the latency of the symptoms, and why in many cases the nervous system should be affected without any other manifestation of syphilis. The problem is not a simple one, and will not be solved until the life history of the spirochætes is more thoroughly worked out. Until more is known we cannot exclude the possibility of several kinds of infection by spirochætes, and it is conceivable that other factors play an essential part, and not until these have weakened the resistance of the individual is it possible for the infective organisms to multiply. The experience of the war is specially significant in this connection.

DIAGNOSIS.—Much work has been done in the examination of the cerebrospinal fluid. As regards the Wassermann reaction, Sicard and Roger³ believe that a negative result excludes general paralysis but may be present in tabes. On the other hand, a positive result is only indicative of nervous syphilis. Browning and Watson² state that "the number of cells present and the presence of abnormal protein in the cerebrospinal fluid are of value as indicating 'organic' as opposed to 'functional' disease, although they do not afford direct evidence of the syphilitic nature of the lesion. If met with in a syphilitic, they should be taken as presumptive evidence of the nervous system being infected". In normal cerebrospinal fluid there is practically only one type of cell present, the lymphocyte. Opinions differ as to how many of these cells may be present without the condition being considered pathological. Marcel Block and Vernes⁴ are quoted as stating that the normal is not more than 1 per cubic millimetre, while Isenegger¹ states there may be 2-4, and Cornaz⁴ puts the figure as high as 5. Brunton¹ described the various abnormal cells present in general paralysis: (1) Plasma cells. These are also present in other types of chronic inflammation. (2) Polymorphs. It is extremely doubtful if these are ever present in health; usually they are only present in acute irritative processes. (3) There are also present lattice, endothelial, phagocytic cells, and fibroblasts. He emphasizes the importance of the high lymphocyte count, and states that although the plasma cell is not pathognomonic of general paralysis, it is strong evidence of a parasymphilitic lesion. It is present in congenital syphilis and tabes. He concludes that a high cell-count with excess of lymphocytes and presence of plasma cells is strong evidence of a parasymphilitic

lesion. These abnormal cells have been found by investigators in other fluids, such as pleural effusion and fluid from tubercular meningitis. Robertson,¹ Latham,¹ and others note the difficulty of diagnosis in some cases. Latham finds it at times impossible to diagnose general paralysis from the peculiar conditions of the cerebrospinal fluid.

Dr. Eva Rawlings⁵ has performed a large series of tests with the colloidal gold solution. From the results she concludes that "the spinal fluids of cases of dementia paralytica cause a quite characteristic curve with the colloidal gold solution which is of such frequent occurrence as to be diagnostic". Further investigation by other observers is necessary before this can be accepted unreservedly.

TREATMENT.—There are no advances in treatment to report. Bassoe⁶ has investigated 26 cases treated by the Swift-Ellis method of Intraspinous Injections. Of these, 8 are known to be alive; 3 are mentally and physically well, 3 mentally well but physically crippled, 1 mentally improved, and 1 temporarily improved but now relapsed. The treatment in most of the cases was commenced and completed during the years 1914, 1915, 1916. As many as 33 intraspinal injections were given in one case. Many workers claim that the intravenous route is as satisfactory as the intraspinal, and much less dangerous.

Intraspinous injections of mercuric chloride about $\frac{1}{150}$ or $\frac{1}{100}$ gr. have been tried, and Hamill⁷ claims to be able to get a negative Wassermann with the cerebrospinal fluid by this means when all others fail, but he omits to state whether the patient is benefited thereby.

Sand⁸ investigated a case of general paralysis treated by intraventricular injection of arsphenium through a trephine opening. The injection was given in March, 1917. The patient died in July, 1917, and Sand found that the lesions on the side of the brain which had received the injection were much more severe than on the other side.

There remains much difference of opinion as to the results of these methods of treatment. Some claim many successes; others state that cases treated either by intraspinal or intraventricular injections actually die sooner than those left alone. Schroder and Helweg⁹ are pessimistic; they doubt if there has ever been a real success and the disease permanently arrested. Temporary improvement is frequent, but in general paralysis remissions are to be expected. They consider, however, that in such a hopeless malady it is of the utmost importance to try almost anything in the hope that even if it be impossible to cure the disease it may be possible to arrest it at an early stage before the patients' powers of work are impaired.

REFERENCES.—¹*Jour. Mental Sci.* lxxv, No. 271 (Rep. Ann. Meeting of Med.-Psychol. Assoc.); ²*Veneral Diseases*; ³*Jour. Nervous and Mental Dis.* xl, No. 2; ⁴*Ibid.* No. 4; ⁵*Arch. Neurol. and Psychiat.* ii, No. 2; ⁶*Ibid.* ii, 484; ⁷*Ibid.* No. 4; ⁸*Ibid.* No. 1; ⁹*Jour. Mental Sci.* lxxv, No. 268.

GERMAN MEASLES. (See RUBELLA.)

GLAUCOMA.

R. Foster Moore, F.R.C.S.

Kearney¹ gives a clear account of the clinical signs and symptoms of the different forms of glaucoma, which should be useful to the general practitioner.

Operative Treatment.—In a paper by J. Van der Hoeve,² one of the chief objects is to emphasize the importance of a careful examination for scotomata in the region of the blind spot in every case in which there is a suspicion of glaucoma. These scotomata may be relative only, and should always be searched for by Bjerrum's method; the ordinary perimeter is not satisfactory. They may be present in cases in which the peripheral visual fields are complete

and the central acuity is unimpaired. The scotoma is usually either crescentic or ring-shaped; in the former case it extends from the blind spot to the horizontal raphe of the retina beyond the yellow spot; but it may extend outwards towards the periphery, forming a sector defect, or inwards, and so threaten the macula lutea itself. These scotomata when present may be reduced or even disappear after a trephine operation after Elliot's method, and most surgeons would agree that the sooner this is done the better.

Borthen's operation is described by Stieren.³ A conjunctival flap containing all the tissues down to the sclera is turned down as for trephining. A small keratome incision is made just behind the limbus. The pupillary edge of the iris is grasped and withdrawn so that the under surface of the iris is in contact with the anterior surface of the incision, and is left in this position. The conjunctival flap is now replaced. The operation is well spoken of by Verhoeff,⁴ who describes the histological findings in cases in which the operation of 'iridotaxis' had been performed. Harrower⁵ and Roy⁶ also add to the knowledge of this operation.

A. E. J. Lister⁷ speaks from a large experience of glaucoma in India. He reports a case in which very low tension with a great fall in vision followed upon trephining for glaucoma. This was succeeded by a considerable increase of tension for which another trephine operation was performed, with a lasting good result. The author's operative treatment consists in iridectomy for acute and subacute glaucoma—in the latter case followed by trephining if need arises—and trephining for chronic glaucoma.

REFERENCES.—¹N. Y. *Med. Jour.* 1919, ii, 11; ²*Zeits. f. Augenheilk.* 1915, xxxiv, pts. 4-6; ³*Ophthal. Rec.* 1917, Feb.; ⁴*Arch. of Ophthal.* 1916, xlv, Jan.; ⁵*Ibid.* 1918, Jan.; ⁶*Ibid.*; ⁷*Brit. Jour. of Ophthal.* 1918, Nov., 560.

GOITRE. (See THYROID.)

GONORRHOEA. (See also PUBLIC HEALTH ADMINISTRATION.)

Colonel L. W. Harrison, D.S.O., R.A.M.C.

TREATMENT.—Loeb¹ reviews his experience of the abortive treatment of gonorrhoea from 1902 to 1914. He finds that success largely depends on the age of the disease. Thus, out of 85 cases, 46·8 per cent were aborted in a week when the treatment commenced on the first day of the disease; 22·5 per cent of 160 cases commenced on the second; and 9 per cent of 55 cases commenced on the third day. He employed many preparations, but always returned to Protargol. Adams² recommends, for the abortive treatment of gonorrhoea, Argylol, which is superior to silver nucleinate. The solution must be freshly prepared, and 2 to 4 dr. of 10 to 15 per cent solution injected and retained for twelve to fifteen minutes. The treatment is practised once daily by the surgeon—not the patient—until all pus has disappeared. The patient will then be entrusted with a mild injection of Protargol ($\frac{1}{4}$ per cent), and treated also with Sandalwood Oil internally. If there is no return of discharge with cloudy urine, the protargol may be increased to $\frac{1}{2}$ per cent, but not more.

Davis and Harrell³ report very favourably on Acriflavine, which they found had great penetrating power and killed gonococci in a strength of 1-300,000. They employed a strength of 1-1000 in distilled water, and injections were retained for five minutes. They detail remarkably rapid cures in 15 cases. Baer and Klein⁴ employed irrigations of 1-1000 to 1-4000 acriflavine twice daily. The average duration of treatment was fifteen days. Out of 37 cases, 22 were cured without relapse, 10 relapsed one or more times, and 5 were not cured. Watson⁵ believes that irrigation of the urethra with 1-4000 acriflavine is the most satisfactory routine treatment for acute gonorrhoea at present available. He reports on 423 cases treated by this method. Out of these, 307 were

acute, and in 222 acriflavine was the only antiseptic employed, with an average duration in hospital of 21 days. If the 26 complicated cases in the series are deducted, the remaining 196 are found to have spent only 19·8 days in hospital. This includes 4·4 days under observation before discharge. [The cases were in a military hospital and retained until believed to be cured.—L. W. H.] Six per cent of the acriflavine treated cases relapsed, but these had been in hospital for an average of only 11 days, giving less than 7 days under treatment. Failure to clear up in 10 days is due to (1) Secondary infection, requiring **Mercury Oxyeyanide Irrigations**; (2) Cystic abscess in the anterior urethra, or an infected para-urethral passage beyond the reach of acriflavine; or (3) Glandular involvement requiring topical treatment. The disadvantage of the remedy is that it stains; but the stains can be removed from clothing by eusol, and from the skin by methylated spirit containing 1 per cent HCl. Armstrong⁶ has tested acriflavine as directed by Davis and Harrell, but cannot confirm their opinion as to its superiority. After three weeks' treatment of 23 cases, 6 still had gonococci in the urethral discharge, and in 13 there was still pus. All the patients complained of the irritation and dysuria produced by the remedy. [The reviewer has seen the various preparations of flavine employed in many military hospitals under his supervision, and has not been impressed by their superiority to permanganate. There is no doubt that 1-1000 is too irritating. In a strength of 1-4000 to 1-5000 acriflavine acts fairly well, but no better than permanganate.—L. W. H.]

Harrison,⁷ reviewing his experience of gonorrhoea during the War, has found that the most satisfactory method of aborting gonorrhoea when the case comes for treatment in the first two days is to: (1) Disinfect the parts with 1-2000 **Mercury Perchloride**; (2) Irrigate the whole urethra with 1-4000 **Permanganate of Potassium**; (3) Inject 10 per cent **Argyrol** or 5 per cent **Protosil**, which is retained for twenty minutes. This treatment is repeated twice daily for three to four days, and the silver injection is omitted during the succeeding week, the permanganate irrigation being continued. He believes that the treatment of gonorrhoea is a matter of drainage in a surgical infection, and that treatment which neglects the principle of draining—e.g., the use of astringents (including strong permanganate) in the acute and subacute stages—is bad. He recommends irrigation of the whole urethra from the first, as it favours drainage far better than purely anterior irrigation. Investigations instigated by him in various large military hospitals to determine the value of colloidal manganese and palladium have failed to disclose any advantage from the use of these preparations. In complications such as arthritis, excellent results follow the intravenous injection of **Antityphoid Vaccine**, 150 to 180 million every three or four days. He has always advocated the use of **Gonococcal Vaccines** in the routine treatment of gonorrhoea, and, being impressed by the low antigenic value of those ordinarily employed, has aimed to improve their antigenic power. His views on this point have been justified by the brilliant results attending the injection of Thomson's detoxicated vaccines. (See below.)

Wyndham Powell⁸ draws attention to the great, but often forgotten, value of **Dilatation** in chronic urethritis. Every case should be submitted to this treatment on recovery to get rid of the infiltrates. The commonest region to be affected is the glandular and lacunar area, extending from the lacuna magna, $\frac{1}{4}$ in. from the meatus, to about $3\frac{1}{2}$ in. along the urethra. Infiltration of the bulb is much less common, but leads then more frequently to stricture, on account of the laxity of the mucous membrane and the quantity of the surrounding cavernous tissue in which fibrous deposits can form. Dilatation should commence only when the urethritis has well died down. It should be preceded by irrigation with **Mercury Oxyeyanide** 1-5000, and followed by **Potassium**

Permanganate 1-5000 or Silver Nitrate 1-8000. The instruments to use are solid dilators to the size which the meatus will admit, and then a mechanical dilator with broad blades. One blade should be applied to the roof. The straight dilator will be used fifty times to the curved once. The dilatation should be continued until the urethroscope shows that the urethral canal has recovered its normal appearance and flexibility. For the prostatic urethra, large sounds are preferable if the meatus will take them, and silver nitrate 1-10,000 to 1-5000 is particularly valuable here, whether after passage of instruments or prostatic massage. In irrigation the entry of the fluid into the bladder is facilitated by deep breathing, by the patient attempting to empty his urethra of the last few drops of urine, or his attempting to close the anus tightly a few times. The effect of these manœuvres is enhanced by the previous instillation, with an eye-dropper, of five to ten drops of a 1 per cent solution of **Cocaine**, which is made up in 1-2000 mercury oxycyanide to sterilize it. The solution is massaged backwards into the posterior urethra. The author describes a new instrument for cauterization of refractory lacunæ. It is a four-inch urethroscope cannula with a small tube running along its inner wall. The flexible probe is passed through the side of the instrument along this tube, and the cauterization is easily carried out, under air distention, in full view of the operator.

Mercuric Chloride advocated for gonorrhœal arthritis (*see p. 10*).

Vaccine Treatment.—Pineo and Baillie⁹ have tried a new form of vaccine treatment, suggested by Capt. L. J. Lickley, R.A.M.C. About 1 c.c. pus was pipetted from the patient's urethra, and mixed in a test-tube with 10 c.c. saline containing 0.5 per cent carbolic. The pus so obtained and treated from twenty-one acute cases was transferred to a half-litre flask and well shaken. Glacial acetic acid was added to make a 0.5 per cent solution, and, after shaking for one hour, an equal amount of carbolized saline was added. After four days the emulsion was found to contain 600 million gonococci per c.c., and was diluted, with carbolized saline, to 24 million per c.c. The doses administered were successively 6, 12, 18, 24, 36, 60, 72, 90, 120, and 150 million at three-day intervals. The authors claim better results in all stages of gonorrhœa than from any other vaccine, and recommend the method for its simplicity.

Treatment by Detoxicated Vaccines.—D. Thomson¹⁰ describes his work since 1917 at the Military Hospital, Rochester Row, to improve the vaccine treatment of gonorrhœa. The disadvantage of the ordinary gonococcal vaccine is that it contains so much toxin that it cannot be given in large enough doses to stimulate a sufficiently strong antibody response. Gonococci are soluble in alkalies, and addition of acid results in a precipitate of the stroma. The supernatant fluid is highly toxic, but the precipitate can be administered in large doses, in which it has a high antigenic value. In order to compare the immunity response to injections of his vaccine with that which develops in the course of the disease and that following injections of ordinary vaccines respectively, he employed the complement-fixation test, with preliminary fixation in the ice-chest for sixteen to eighteen hours. Four series of gonorrhœal cases were tested: (1) No vaccine; (2) Treated with small doses of ordinary gonococcal vaccine; (3) Treated with larger doses of ordinary gonococcal vaccine; and (4) Treated with very large doses of detoxicated gonococcal vaccine. The immunity response shown by the above series was in the reverse order in which they have been set out, (4) giving by far the highest and (1) the least.

Lees¹¹ was associated with Thomson in the above investigation, his part being to watch the clinical results. He details the clinical behaviour of the four series of cases mentioned in Thomson's paper. The cases in each series were similar, and the local treatment was the same in all, the only

difference being in the matter of the vaccine treatment. The test of cure applied to all was very stringent, those in series 1, 2, and 3 being kept in hospital for twelve days, and those in the detoxicated vaccine series (4) for eighteen days without treatment before being discharged as cured. During the period of observation every endeavour, including four irrigations with irritants, was made to provoke the reappearance of gonococci in the urethral secretion. The results showed as follows. The urethral discharge ceased in series 1, no vaccine, in 46 days; in series 2, small doses of ordinary vaccine, in 33 days; in series 3, medium doses of vaccine, in 30 days; and in series 4, detoxicated vaccine, in 17 days. No pus or gonococci were found after 36, 22, 20.2, and 14 days respectively, and the total time spent in hospital was 58, 45, 42, and 35 days respectively. Altogether the results showed that in vaccines generally, and in detoxicated vaccines particularly, we have a most important aid in the treatment of gonorrhœa, and one which materially shortens the duration of treatment. The detoxicated vaccine was given in doses increasing from 2500 to 10,000 million, the total amount administered in eighteen days being 40,000 million. [The reviewer, having instigated the above work, may perhaps be permitted to add the following. In the investigation of new remedies for gonorrhœa it is particularly important to eliminate personal bias. It is so easy to convince oneself that a case of gonorrhœa is cured when the discharge has ceased, and to believe, on the strength of a few cases clearing up rapidly, that the goal has been reached. The instructions were that parallel series of cases under different lines of treatment should be investigated; that the test of cure should be the same in every case; and that every human means should be employed to test the validity of the cure. The reviewer believes that both investigators faithfully observed these instructions in the spirit as well as in the letter, and that their work constitutes an important advance in the therapy of gonorrhœa.—L. W. H.]

REFERENCES.—¹*Munch. med. Woch.* 1919, June 20, 688; ²*N.Y. Med. Jour.* 1918, ii, 679; ³*Jour. Urol.* 1918, ii, 287; ⁴*Munch. med. Woch.* 1918, lxxv, 970; ⁵*Brit. Med. Jour.* 1919, i, 571; ⁶*Ibid.* 709; ⁷*Lancet*, 1919, i, 219; ⁸*Brit. Med. Jour.* 1919, ii, 161; ⁹*Lancet*, 1919, i, 508; ¹⁰*Ibid.* 1102; ¹¹*Ibid.* 1107.

GONORRHOEA IN WOMEN.

W. E. Fothergill, M.D.

W. E. Fothergill¹ describes gonorrhœa in women as an acute infective fever which produces two groups of local lesions, the one affecting the external and the other the internal reproductive organs. Patients are seldom seen during attacks of acute gonorrhœal vulvitis when the gonococcus is to be found in the discharge. During pregnancy and in childhood these attacks are specially severe, and often come under medical observation. The cases of persistent vulvovaginitis which are seen every day by medical men are generally septic infections following attacks of acute gonorrhœa. In them the gonococcus can but seldom be demonstrated.

As to internal gonorrhœa, the patient is comparatively seldom seen during acute metritis, salpingitis, ovaritis, and peritonitis of gonorrhœal origin. But she constantly seeks advice for the lasting results of the acute inflammatory process—adhesions, sactosalpinges, tubo-ovarian masses; these, when explored, do not contain gonococci. Again, patients often come under observation for acute recurrent attacks of pelvic infection, not by the gonococcus, but by other organisms transmitted from foci of infection in various parts of the body to pelvic organs which have been permanently injured by previous acute gonorrhœal inflammation. In these acute recurrent attacks the gonococcus is not found as a rule.

Thus, in hospitals for women, five groups of cases are seen in which gonorrhœa is the prime cause: (1) Acute vulvitis, gonococcus present—rarely seen;

(2) Persistent vulvovaginitis, no gonococci—often seen; (3) Acute metritis, salpingitis, etc., gonococci present—seldom seen; (4) Lasting results of (3), sterile—often seen; (5) Acute recurrent attacks, septic—often seen. Groups 2, 4, and 5, therefore, in which gonococci are not found, form the bulk of the cases which come under treatment. Of gonorrhœa itself but little is seen, for women in the acute stages seldom seek medical advice. Gonorrhœa is spread about, not by women with symptoms, but by those who carry gonococci without personal inconvenience, and by those who are constantly getting freshly infected and having acute attacks so mild that they are ignored. These people do not go to venereal clinics; even the lure of free treatment fails to bring them under observation. So far as gonorrhœa is concerned, it is very doubtful whether the clinics recently established will do much good. There is not much gained by seeing a drunkard through one drinking bout, or by curing one acute attack of gonorrhœa.

REFERENCE.—¹*Brit. Med. Jour.* 1918, Dec. 28.

GONORRHOEAL EPIDIDYMITIS. (See TESTICLE.)

GRANULOMA VENEREUM.

E. Graham Little, M.D., F.R.C.P.

This disease is so seldom seen in this country that reports of cases shown in England are of special interest. Firmin Cuthbert contributes such a case, and also the oil-colour reproduced herewith (*Plate XVI*), which represents the condition seen after an operation had been performed removing the penis, which had almost completely ulcerated away. The patient was an Englishman long resident in Brazil, where the disease had first shown itself, and where an unusually large number of cases have occurred. A chronic ulceration had persisted for some fifteen years, proving most intractable, and causing destruction of a large part of the genital area. As a result of reading an article in the *MEDICAL ANNUAL* for 1919, Cuthbert gave four intravenous injections of *Tartar Emetic*, with the result of complete healing of the hitherto unchecked ulceration.

REFERENCE.—¹*Brit. Jour. Dermat.* vol. xxxi.

HÆMATEMESIS, TREATMENT OF.

Robert Hutchison, M.D., F.R.C.P.

Bastedo¹ discusses this subject in the light of physiological considerations. To favour clotting at the site of bleeding there should be "a quiet contracted stomach, quiet heart and respiration, avoidance of vomiting, and careful watching during the introduction of fluids to restore the blood-volume". Morphine achieves these purposes, but has the disadvantage, in large doses, of causing atonic dilatation of the stomach. It should, therefore, be combined with a maximum dose of Strychnine. He does not believe in the use of emetine.

Lavage may be employed if the stomach remains distended and there is evidence that the bleeding still continues. It should not be done if the patient retches much on the introduction of the tube. Only a small amount of fluid should be used, and at a moderate temperature. A coagulant may be run in through the tube afterwards.

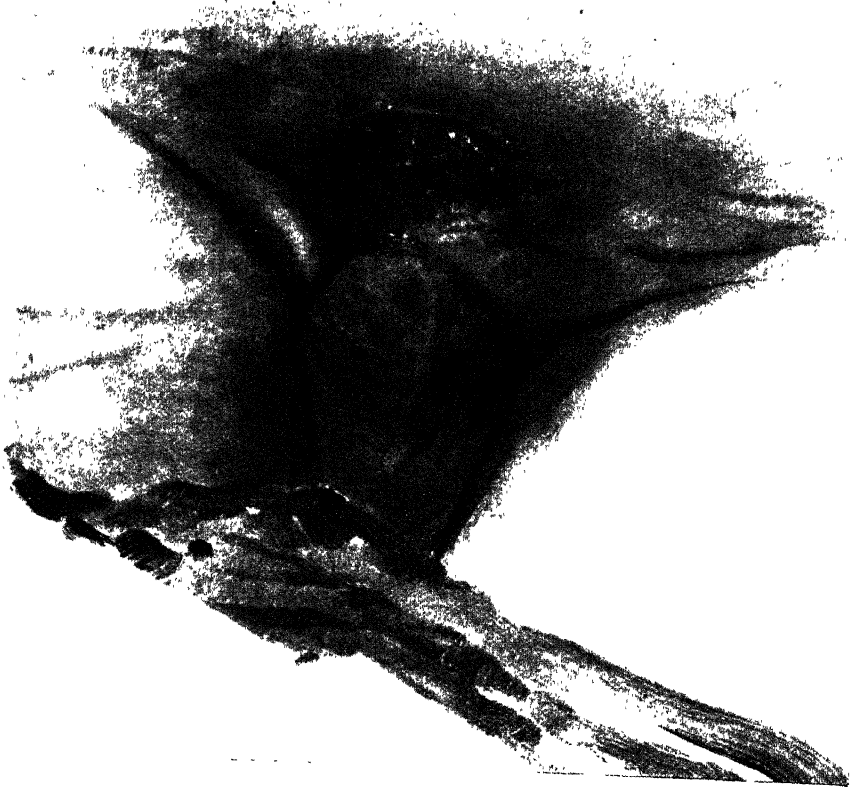
Adrenalin may be given by mouth in doses of 1 dr. to 1 oz. of the 1-1000 solution diluted with about 2 to 5 times as much water. It has the disadvantage of inducing strong peristalsis.

Coagulants may be employed to increase the coagulability of the blood. They are most likely to be of use where there is a continuous small oozing, or to prevent a recurrence of profuse hæmorrhage. The preparations known as Thromboplastin, Kephalin, and Coagulen are suitable. Calcium is futile, as it has to be given in large doses for some days to influence coagulability.

The author has more faith in transfusion than in all other measures put

PLATE XVI.

GRANULOMA VENEREUM



From a painting kindly lent by Dr. C. Firmin Cuthbert.

together, but the blood-pressure should be watched during the process lest a rapid rise should loosen the clot.

As regards the question of operation, he expresses himself as follows: It is the consensus of opinion that while surgery may be called for in recurrent hæmorrhages, immediate surgery is contra-indicated in the presence of a profuse hæmorrhage. It has been estimated by Moynihan that not over 3 per cent of profusely bleeding gastric or duodenal ulcers could be treated successfully by laparotomy. As a matter of fact, either spontaneously or because of or in spite of the medical measures employed, nearly all hæmorrhages cease and are not fatal; so that by the time we have decided that the hæmorrhage is not going to cease, the patient is beyond the point of safety for an operation. Lindberg, of Faber's clinic in Copenhagen, tabulated 68 cases so severe as to raise the question of an emergency operation. It was decided in all the cases to give medical treatment. Only 5 died, and the autopsies showed that not one could have been helped by surgery. These statistics, together with statistics from other clinics where operations were performed, convinced Lindberg that surgical measures are never indicated in cases of acute hæmorrhage from the stomach or adjacent bowel. Lund recently said: "I have learned that it is poor practice, when the patient is depleted by hæmorrhage, to open the stomach and try to grasp the artery in the bottom of an ulcer".

The author summarizes his treatment thus: The aims in the treatment of profuse hæmatemesis are: (1) *To stop the bleeding*; (2) *To overcome its effects*; (3) *To prevent its recurrence*.

1. Have patient very quiet, lying down, head low, with a light ice-bag over the stomach, and with plenty of fresh air. Avoid unnecessary manipulation. Give a hypodermic of morphine sulphate 0.015 grm. ($\frac{1}{4}$ gr.) with strychnine sulphate 0.002 to 0.003 grm. ($\frac{1}{30}$ gr. to $\frac{1}{20}$ gr.). Immediately after vomiting, give by mouth a solution of **Thromboplastin**, **Kephalin**, **Coagulen**, or **Epinephrin**. In a case not of the portal congestion type, if the stomach remains distended and the bleeding seems to persist, lavage with tepid water, and follow this by passing in a solution of epinephrin, thromboplastin, kephalin, or coagulen through the tube. In portal congestion cases avoid lavage.

2. Prepare early for **Transfusion**, and as soon as there are indications for it transfuse with careful watchfulness. If there is severe exsanguination, bandage legs and arms, raise the foot of the bed, bandage and put weights on the abdomen, keep up body warmth, and furnish fluid intravenously, subcutaneously, and by rectum. If transfusion cannot be done, give intravenously Locke's or Ringer's solution containing 5 per cent of **Acacia**. Finally, have a surgeon at hand to share the responsibility, but do not operate.

3. To prevent recurrence, inject subcutaneously, every six to twelve hours for one or two days, 10 to 50 c.c. of human, rabbit, or horse serum, or a solution of coagulose or euglobulin, or a single dose of 100 to 500 c.c. of human serum; or inject intramuscularly a solution of coagulen, thromboplastin, or kephalin.

If recurrence happens, resort to surgery, if necessary, preceding the operation by transfusion: (a) After the bleeding has stopped; or (b) If the bleeding continues but has become persistently small in amount.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1919, i, 99.

HÆMOPHILIA.

Herbert French, M.D., F.R.C.P.

TREATMENT.—Any fresh suggestion for the treatment of hæmophilics suffering from acute exacerbations of their malady must be welcomed. Monro¹ draws attention to the possible value of **Emetine Hydrochloride** in this respect. His patient, belonging to a typical hæmophilic family, had suffered from severe

and continuous hæmaturia. He was kept in bed, and most of the usual remedies were tried in turn—first calcium chloride, then calcium lactate for ten days; then ergot, gradually increasing to large doses; then liquor ferri perchloridi and other astringents. Adrenalin was given by the mouth, and gelatin hypodermically. Pituitrin injections were tried for a week, and after that horse serum, first by the mouth, and later hypodermically in doses of 15 to 20 c.c., and without any improvement. The hæmorrhage in the urine persisted unabated, and by the middle of the ninth week the patient's condition had become very serious; he was quite blanched, his face the colour of his pillow. Epileptic seizures ensued, and the boy, with a temperature of 104°, was dull, listless, difficult to rouse, and had a pulse-rate of 140. The condition was extremely grave, and at this stage Monro gave him emetine hydrochloride gr. $\frac{1}{4}$ by hypodermic injection in the forearm. The result was remarkable. The next morning the patient was in a profuse perspiration, complained of pains in his joints, and the arm was swollen. The urine was scanty and still bloody, but the temperature had fallen to 100°. The following day the temperature was normal, the joints were better, and he passed normal-coloured urine, the first for ten weeks. From that time the patient made a steady recovery, and the hæmaturia did not recur. Monro clearly attributes this result to the emetine hydrochloride injection, although there is the possibility, one supposes, of the benefit having resulted from some of the previous treatments, such for example as the serum injections with their delayed after-effects. The possible value of emetine hydrochloride in the treatment of some of the severer complications of hæmophilia seems worthy of being tested further by those who have cases under their care.

REFERENCE.—¹*Pract.* 1918, Sept., 167.

HÆMOPTYSIS. (See TUBERCULOSIS, PULMONARY.)

HÆMORRHAGE. For local hæmostatics (see p. 7.)

HÆMORRHOIDS. (See PILES.)

HAY FEVER. (See also ASTHMA, BRONCHIAL.)

Arthur Latham, M.D., F.R.C.P.

William Scheppegegrell,¹ dealing with spring hay fever, states that in developing an active immunization against hay fever, hypodermic injections are made with the **Extract of Pollen** to which the patient is sensitive and to which he will be exposed. If, for example, the patient is found sensitive to a grass pollen, the prophylactic treatment should be preferably commenced six weeks before the opening of the spring hay season. Grass pollen extract should be injected two or three times weekly, commencing with 10 units, and increasing gradually to 100 units. As soon as hay fever is due, the injections should be reduced to 10 or 20 units. The author states that in an analysis of 707 cases, there were seasonal cures in 49 per cent and marked improvement in 40 per cent. In 4 per cent there was no perceptible improvement, and in 7 per cent the patients discontinued the treatment before the results could be noted. In no case was there any aggravation of the symptoms from the treatment, or any other ill effect.

Ira Frank and Solomon Strouse,² in their article on **Pollen Extracts and Bacterial Vaccines** in hay fever, hold that there can be no doubt that hay fever patients represent a state of hypersensitiveness to a definite pollen, and that there are theoretical considerations indicating the presence of a complicating infection. In view of this, and because of the inconclusive results of pollen therapy, and because bacterial vaccine therapy showed as good results or better

than pollen therapy, they come to the conclusion that the logical treatment of the disease would be a combination of the two methods. After investigation on these lines they formed the following conclusions :—

1. Specific therapy should not be undertaken in the presence of pathological conditions in the nose or accessory sinuses. The removal of polypi or similar operations do not cure hay-fever patients, but such operations may be necessary if subsequent therapy is to be successful.

2. In a disease with the remarkable seasonal variations of hay fever, it would be folly to attempt to draw definite or final conclusions from the work so far reported ; but from the consideration of results it is fair to say that the method of treating hay-fever patients by early prophylactic injections of pollen extract, combined with late and intensive injections of autogenous bacterial vaccines, offers the greatest therapeutic promise of any method so far advanced in the treatment of this disease. Pollen extracts alone and bacterial vaccines alone, while giving results, do not seem to relieve so many patients as does the combined therapy. Treatment with pollen extract should start early in the season (June or July), and should be discontinued at the height of symptoms, at which time bacterial vaccines should be substituted.

3. Injections one year have not prevented attacks the succeeding year ; but in patients receiving continued treatment from year to year there is a definite tendency for the hay fever symptoms to become progressively less severe.

REFERENCES.—¹N. Y. *Med. Jour.* 1919, May 10, 793 ; ²*Jour. Amer. Med. Assoc.* 1919, May 31, 1593.

HEADACHE. (*See also* MIGRAINE.)

J. Ramsay Hunt, M.D.

WAR HEADACHE AND ITS SURGICAL TREATMENT.

Bathe Rawling¹ describes this group of cases, of which he has had a large experience. All of them were secondary to gunshot wounds, concussion, fractured base, etc. The more severe headaches are associated with an intact skull (closed box) or with small defects. With large deficiencies headaches are less frequent. Frontal and temporal injuries are more commonly accompanied by headache than injuries in the parietal, occipital, and cerebellar regions. Wounds near the vertex, in relation to the superior longitudinal sinus, are frequently associated with a severe type of headache. The presence of foreign bodies within the skull is commonly accompanied by chronic headache, especially when the foreign body is situated in relation to the ventricles of the brain.

The severity varies greatly, from mild and inconstant attacks, through every degree and grade of headache, to the most severe and persistent pain. Perhaps the most common type is as follows—a 'cyclic' headache: two or three days' comparative immunity, followed, without warning, by an attack severe even at its inception. This culminates within a few hours in more or less complete prostration. In explanation of this 'cyclic' headache, it would seem probable that the cerebrospinal fluid, by reason of insufficient absorption, slowly increases in quantity, finally arriving at a certain maximum, this coinciding with the period of maximum intensity of headache. By this time the fluid leads to such increase of intracranial pressure that some relief takes place automatically, the various channels being opened up so that some excess fluid can escape. The intracranial pressure is correspondingly relieved and the symptoms diminish proportionately.

CAUSATION.—These headaches are dependent on some general increase of intracranial pressure, and this in turn is due in the great majority of cases to excess cerebrospinal fluid—cerebral oedema. The oedema is very apparent at the decompression operation, and the symptoms are relieved or cured within a

few hours of the drainage supplied by the decompression. In some few cases, even where a diagnosis of cerebral oedema was made, no oedema has been found—merely a tense dura mater and a brain under pressure. It is to be presumed that, in these somewhat exceptional cases, there is a condition of ventricular distention, due probably to interference in the normal channels at the base of the brain, with perhaps some ventricular hypersecretion. So far as Rawling's present experience goes, there are two points in the differential diagnosis between headache due to cerebral oedema and that dependent on ventricular distention. In the later condition true papilloedema is more likely to be present, and the patient evidences more marked apathy and somnolence—a more defined state of slow cerebration. However, operative measures are indicated in both conditions, and results obtained by decompression are almost equally favourable.

ASSOCIATION WITH OTHER SYMPTOMS.—Headache may be the sole evidence of the conditions existent, or there may be: (1) Slowing of the pulse-rate, with but little raising of blood-pressure. (2) Marked giddiness. (3) Elevation of temperature frequent, 99° to 100°, night after night: this may persist for months. (4) Insomnia. (5) Slow cerebration, listlessness, anxiety, uncertain temper, depression; patients unable to undergo any exertion, all attempts being followed at once by headache exacerbation. (6) Tendency to exaggeration of all reflexes. (7) Nausea uncommon; vomiting rare. (8) Slight blurring of the discs—retinal veins engorged and tortuous; diminution of the visual fields; true papilloedema rare, unless the case is complicated by the presence of foreign bodies in the brain substance, especially when related to the ventricular spaces. (9) Bowels natural, except for some constipation; urine normal. (10) Appetite good, except during an extra severe attack. (11) Fits, generalized, epileptiform.

TREATMENT.—This may be considered under three heads: **Rest**, with **Dietetics and Drugs**, **Lumbar Puncture**, and **Decompression**. Unless the conditions are exceptionally severe, the routine course occupies about three months, the patient first passing through a probationary period of rest in bed, with careful dieting, and with such medicinal treatment as seems fitted to the case.

Lumbar puncture has been carried out frequently. It would be expected that excess cerebrospinal fluid, as represented by cerebral oedema, would be capable of confirmation by means of lumbar puncture. This, however, is by no means the case. Lumbar puncture may show a fluid of considerable excess and at high pressure with a perfectly dry cortex, as revealed by subsequent decompression operations. In other cases a puncture yielding negative results may be associated with a high degree of cerebral oedema. Sometimes it brings about alleviation, even marked relief; but this endures for a short time only, the headache soon returning, often more severe than before. Sometimes also the effect of lumbar puncture is to produce immediate exacerbation of headache.

Rest, dietetics, drugs, and lumbar puncture failing, the **Subtemporal Decompression** will almost certainly bring about relief or cure within forty-eight hours of the operation.

PITUITARY HEADACHES AND THEIR CURE.

Pardee² points out that pituitary disturbances constitute a fairly common cause of headache, which is localized between the temples, deep in behind the eyes, and is accompanied by dyspituitary signs. Some abnormality of the sella turcica is demonstrable in almost every case of pituitary disease. The administration of **Pituitary Gland** will cure these headaches and the accompanying symptoms in a large percentage of cases, provided there is not a progressive neoplastic growth. The average dose is 1 gr. given an hour after

meals. Larger doses are recommended by some authors, and Cushing gives as much as 15 gr. daily in some cases. For a more rapid action, hypodermic injections of pituitary extract, 0.5 to 1 c.c., are recommended.

REFERENCES.—*Brit. Med. Jour.* 1919, i, 476; *Arch. Internal Med.* 1919, Feb., 174.

HEART DISEASE. (See also ANGINA PECTORIS; AORTA, SYPHILIS OF; ENDOCARDITIS, ULCERATIVE; HEART, IRRITABLE; HEART, RADIOGRAPHY IN, p. 25.) Carey Coombs, M.D., F.R.C.P.

SYMPTOMS.—*Left scapular pain.*—The incidence of this symptom in disorders and diseases of the heart has been carefully worked out by Parkinson.¹ He finds that pain at the lower angle of the left scapula often supervenes upon chronic pain below the left breast. Both areas are supplied from the sixth thoracic spinal segment. Hyperalgesia often accompanies such pain; it tends to affect a wider area than the pain itself. Persistence of this hyperalgesia in the course of chronic heart disease or disorder "indicates a new and troublesome phase". Parkinson's cases were examples of cardiac disease and disorder of many types. In about half his cases no sign of organic disease was found; of the organic cases, nearly half were of the post-rheumatic type.

DIAGNOSIS.—The application of precise physical apparatus to the study of cardiac disease still engages the attention of many workers. Bordet² describes the method of *measuring the size of the heart by radioscopy* devised by Vaquez and himself. It is based on the belief that the hypertrophied left ventricle is often enlarged more in an anteroposterior than in a transverse diameter, and its technique therefore consists of means for measurement of the anteroposterior diameter of the heart. Alessandrini³ proposes to express the size of the heart in terms of the product of the longitudinal and the transverse diameters of the heart as ascertained by radioscopy. The same figures may, he claims, be used to determine whether the right heart is enlarged; if the figure resulting from division of the transverse by the longitudinal diameter exceeds 0.96, the right heart is absolutely or relatively enlarged. Danzer⁴ is content to measure radioscopically the transverse diameters of thorax and heart respectively. If the latter is over 50 per cent of the former, a suspicion of cardiac disease must be entertained.

The *electrocardiographic* method, again, continues to yield a rich harvest of observations. These are principally of two kinds: records of rare cases of arrhythmia, and systematic observation of anomalies of the electrocardiogram with an attempt to correlate these with the malady to which they owe their origin. It is this latter kind of work from which most is to be hoped. Some of its recent results may be briefly alluded to here, for though it is essentially research work, it is possible that some of the data may acquire clinical value. Aberrations in the electrocardiographic record of the chief ventricular movement are described by Willius,⁵ Carter,⁶ Widd,⁷ and Silberberg.⁸ The first three adduce a certain amount of histological evidence in favour of their thesis, that these aberrations (widening of the Q R S portion of the electrocardiographic curve, with notching of the apex of R and splintering of its limbs) prove diffuse disease of the ventricular myocardium. Indeed, they go further, and claim that it is possible to trace these alterations in the record to interference with conduction of the stimulus through the special paths, the ramifications of the Tawara system. Whether this be true or not, it seems pretty clear that the electrocardiographic variations described coincide with diffuse intramyocardial lesions. Harris⁹ and Klewitz¹⁰ also point out a relation between diffuse myocardial disease and inversion of the T wave of the electrocardiogram.

PROGNOSIS.—If we were unable to form an opinion as to the future of cases of progressive cardiac disease without the use of the methods just described,

a majority of our cardiac patients would go without a prognosis. Fortunately, however, we are not so limited. In the words of Lewis,¹¹ "the essential . . . is to know the amount of work which must be undertaken to bring forth distress, . . . a method within the easy reach of every practitioner. . . . He may have an exhaustive knowledge of electrocardiography, polygraphy, blood-pressure, percussion, the stethoscope, and what not; as a practitioner he is better without that knowledge if the first knowledge is lacking".

R. D. Rudolf,¹² Sir William Osler,¹³ Sir Clifford Allbutt,¹⁴ and C. D. Muspratt¹⁵ tell of patients who have lived long and strenuous lives in spite of a leaking aortic valve. Sir Clifford Allbutt adds this caution, that the development of extrasystoles may serve to upset the long-maintained balance of such a patient, and kill suddenly by syncope.

White¹⁶ has followed up a series of cardiac patients, 100 of them displaying an alternating pulse, 100 auricular fibrillation, and 100 a normal rhythm, for a period of two to three years in a majority; 74 per cent of the first group, 48 per cent of the second, and 47 per cent of the third have died in that time. The mortality of patients with high grades of alternation, and of those with premature ectopic ventricular beats added to auricular fibrillation, was very high, approximating to 100 per cent in the period named.

TREATMENT.—Those who object to the detailed exploration of the symptoms and signs of cardiac disease on the ground that it leads to no practical therapeutic result, forget that the more cardiac disease is understood, the more hopeless does the prospect of cure become. The bulk of organic heart disease is progressive. Any impairment of cardiac function spoils the supply of oxygen and foodstuffs to the cells of the body, the myocardium included; and this again limits the contractile power of the myocardium. An inexorable vicious circle is set in motion, which treatment cannot stop. The appreciation of this knowledge is diverting attention from treatment to prevention, wherein lies the hope of the future.

But even if treatment cannot avert disaster, it can delay it. Cardiac failure is in a majority of cases due to an increasing incapacity of the cells of the myocardium to manufacture contractile substance as fast as it is demanded. Treatment may therefore be directed either to retarding the demand for contractile substance or to encouraging its manufacture. In practice the former method is the more often employed, for as Lewis¹¹ reminds us, the favourable action of digitalis on the heart is a sedative action. The drug puts a break on the stimulation of the heart, and, by diminishing the frequency of the cardiac beats, increases the duration of each diastole, giving the myocardial cells more time to replenish themselves. Laubry and Esmein¹⁷ comment on the value of **Opium** and its derivatives in cardiac disease. The indications which they specify include angina pectoris, acute pulmonary oedema, the paroxysmal dyspnoea of cardiosclerosis with hypertension, and some attacks of paroxysmal tachycardia. They do not find renal disease a contra-indication. [In cases of progressive failure of the left ventricle, the unrelieved respiratory distress of the last phase is made bearable by opium as by nothing else.—C. F. C.]

A number of interesting papers treat of the uses of **Digitalis** and **Strophanthus**. Galli¹⁸ tells a story of a patient who was ordered to take 20 drops daily of the tincture of strophanthus for the rest of his life; an order which he obeyed for about two years without evil effect.

Whiting¹⁹ and Parkes Weber²⁰ record the dramatic results of **Strophanthin** (gr. 100) injected intravenously in cardiac failure; a plan which is of course not infallible, but productive of remarkable results in suitable cases, pre-eminently of course in auricular fibrillation with urgent asphyxial symptoms. Wedd²¹ has observed variations in the effect of **Digitalis** tinctures which he

ascribes to variability in the rate of absorption from the alimentary canal. He does not find high blood-pressure, conductivity defects, etc., contra-indicate the use of the drug.

Perhaps, indeed, modern medicine has rather over-emphasized the peculiar value of the digitalis group in auricular breakdown with total arrhythmia. At all events, writers are beginning to call attention to its applicability to other phases of cardiac disease. Wedd speaks of its potency in one case of pulsus alternans; and Christian²² quotes similar examples to show that it seems to act helpfully in some cases of primary ventricular failure. Sutherland²³ contributes valuable observations on the therapeutic action of Digitalis on the rapid, regular, rheumatic heart. Ten cases are described, all of them in children under 14, with rapid but regular cardiac action due to rheumatic carditis. The observations were made during apyrexial periods of the disease, and nervous causes of the tachycardia were as far as possible excluded, though it is difficult to say exactly what is the cause of the rapid beating in such cases. Sutherland suggests that it is due to rheumatic invasion of the pace-maker area—the sinu-auricular junction. Whatever its cause, its effects are harmful, since the rest-period of a damaged myocardium is lessened and its chance of repair thereby interfered with. The average slowing effected by digitalis was from 124 to 82 per minute, in an average of five days. That this was due to the action of the digitalis is probable, because the pulse-rate ran up when the drug was stopped and came down again when it was resumed. The suggestion is that digitalis acted thus by stimulating vagus inhibition upon the pace-maker of the heart, the sinu-auricular node. That good resulted from the slowing of the heart was incontrovertible, in Sutherland's opinion, but it is apt to be undone by the recurrences that are so characteristic of rheumatic carditis.

Brief notice must be given to Bergmann's²⁴ remarks on Quinidine, an alkaloid of cinchona isomeric with quinine. In his hands it has exerted a 'digitalis effect' in arrhythmia perpetua, even restoring normal rhythm in some cases. He quotes other observers in support of his claims.

REFERENCES.—¹*Lancet*, 1919, i, 550; ²*Ibid.* 1918, ii, 750; ³*Políclínico (Soc. Prat.)*, 1919, May, 545; ⁴*Amer. Jour. Med. Sci.* 1919, i, 513; ⁵*Arch. Int. Med.* 1919, i, 431; ⁶*Ibid.* 1918, ii, 331; ⁷*Ibid.* 1919, i, 515; ⁸*Med. Jour. of Australia*, 1919, May; ⁹*Lancet*, 1919, i, 168; ¹⁰*Deut. Arch. f. klin. Med.* 1919, April, 41; ¹¹*Brit. Med. Jour.* 1919, ii, 621; ¹²*Ibid.* 1919, i, 7; ¹³*Ibid.* 55; ¹⁴*Ibid.* 85; ¹⁵*Ibid.* 200; ¹⁶*Amer. Jour. Med. Sci.* 1919, i, 5; ¹⁷*Paris Méd.* 1918, 296; ¹⁸*Presse Méd.* 1919, 43; ¹⁹*Med. Press and Circ.* 1919, 313 and 334; ²⁰*Ibid.* 84; ²¹*Johns Hopkins Hosp. Bull.* 1919, 131; ²²*Amer. Jour. Med. Sci.* 1919, i, 593; ²³*Quart. Jour. Med.* 1919, April, 183; ²⁴*Münch. med. Woch.* 1919, 705.

HEART, IRRITABLE.

Carey Coombs, M.D., F.R.C.P.

To the knowledge acquired during the war by observation of the 'effort syndrome' in the European armies must be added data from two sources: (1) American experience; and (2) Deductions from observation of similar syndromes in civil practice.

ETIOLOGY.—The careful examination of recruits which the Americans were able to carry out confirmed our belief in the importance of the *inherent proclivity of certain individuals* to this syndrome. The percentage of recruits rejected because it was seen that full military service would certainly lead to breakdown of the 'effort syndrome' type is stated as 0.5 by Fahr.¹

In addition to this inherent factor, or complex of factors, certain *acquired* factors have become more clearly defined. These are partly psychical and partly physical. The relative importance of these two classes of injury to, and exhaustion of, the tissues appears different to different observers. Let us first record their several existence, and then see how they aid and abet one another.

Prominent among the *physical* factors must be included *infection*. There are

indeed those who think this the one essential factor (Wilson and Carroll²). These point to the chronicity of trench fever (Bryan), amoebic dysentery (Jepps and Meakins), and malaria, and to the large percentage of irritable-heart cases in soldiers in which such an infective factor may be unearthed by inquiry. Many such cases, too, have been traced to a latent tuberculosis—another argument on behalf of the infective factor. Recent experiences in civil practice have shown how often influenza has been responsible for precipitating the onset of irritable-heart symptoms.

Exposure to heat is another factor worthy of note. Fahr¹ noted that those Texas recruits who had to be rejected as being certain to develop the effort syndrome, were particularly susceptible to the exhausting effect of hot weather. Stawell³ remarked upon the obvious connection between this factor and the incidence of 'soldier's heart' among Australian troops in Egypt. In the writer's experience in Mesopotamia, certain cases of tachycardia with symptoms were directly traceable to the effect of heat. Some individuals showed a personal susceptibility to this factor which was quite unmistakable.

Probably, also, *physical fatigue* due to chronic over-exertion, want of sleep, and occasional shortage of food, has played a part. It is very difficult to separate so all-pervasive a factor as this from the others, so that its relative importance can scarcely be gauged; but this is not to deny its existence.

That the *psychical* factor exists is undeniable. Bridgman⁴ describes it well when he says that "individuals vary as to their power of resistance to psychic trauma, and many individuals after prolonged psychic trauma may show signs of 'effort syndrome'". His experience at a base camp for the treatment of 'effort syndrome' was that on comparing notes with the medical officers of an adjoining psychiatric camp it was found that both teams were treating the same kind of case in the same way, but under a different label. If the man came first to the psychiatrists, his condition was called 'anxiety neurosis'; if first to the cardiac observers, 'effort syndrome'. And as Neuhoof⁵ points out, the irritable heart is encountered in civil practice as a result of conditions of nervous and emotional stress, often when the infective factor can be excluded.

To sum up: the syndrome 'irritable heart' arises, in certain predisposed persons more easily than in the average man, as a result of breakdown influences, both physical and psychical.

PATHOLOGY.—Here we are on very debatable ground. The syndrome has no morbid anatomy, and its pathology is therefore fair game for the clinician and the physiologist. It is almost impossible to find any set of established facts issuing from their researches. The one thing certain is that the seat of the disorder is not in the heart alone or even principally. It seems probable, also, from general considerations, that the essential change is exhaustion of certain tissues by speeding-up of their katabolism, aggravated in many instances by the destructive action of bacterial toxins on those same tissues. But what are those tissues? The argument in favour of identifying them with the autonomic nervous system and the related endocrine glands has been stated very clearly by Langdon Brown in his Croonian Lectures.⁶ Probably a majority of observers would agree with this view of the pathogenesis of the syndrome. But there is a sharp difference of opinion as to the actual incidence of morbid change on the several constituents of the autonomic system, and there is as yet not enough evidence to prove a case on either side. Cannon's⁷ hypothesis, that fear and such-like experiences stimulate the true sympathetic and thus mobilize adrenalin, causing further sympathetic stimulation, is supported by a good deal of work, his own and others', but it is not yet accepted without question.

SYMPTOMS.—Thayer Smith and Bovaird⁸ have examined a small series of

cases statistically. Their summary of symptomatology may be taken as typical of results obtained by all observers. They found that patients complained almost constantly of dyspnoea on exertion, palpitation, pain over the heart, giddiness or fainting, and exhaustion.

The important physical sign is unduly ready quickening of the pulse in answer to physical and psychical stimuli; with its even more characteristic corollary, retardation in a return of the pulse-rate to normal on resumption of rest. In confirmed cases the pulse keeps fast all the time. Meakins and Wilson⁹ proved by tests the abnormal reaction to sudden visual and auditory stimuli. Sinus arrhythmia is often pronounced. There are no signs of structural disease of the heart. King¹⁰ examined a large number and found that murmurs encountered were only accidentally related to the syndrome. Meakins and Gunson,¹¹ working with the orthodiagraph, show that the 'irritable heart' is if anything smaller than normal.

The fainting attacks which constitute the most alarming feature of the syndrome have been carefully described by Cotton and Lewis.¹² There are often premonitory giddiness, nausea, and epigastric discomfort. Consciousness is lost, sometimes so abruptly that the patient falls. Muscular rigidity is the rule, sometimes followed by spasmodic movement of the head and upper limbs. The patient always recovers, often with a sense of weariness which soon passes off. Sometimes the attack is due to some obvious provocative such as the sight of blood. The actual cause is anæmia of the brain, due to slowing of the pulse (which may fall from its usually high level to normal, or even as low as 30) combined with enfeeblement of the heart beat. These factors are of vagal origin and may be relieved by *Atropine*.

The 'irritable-heart' syndrome may be superimposed on an organic cardiac lesion, and careful observation is necessary to determine what proportion of the symptoms has an organic basis.

PROGNOSIS.—In last year's *MEDICAL ANNUAL* the statement ascribed to Dr. Thomas Lewis by the writer, to the effect that the disability rate of the pensioner with 'D.A.H.' varies from 20 to 50 per cent for six to twelve months, was too compressed to give the true meaning of the passage quoted. Its full truth is that the disability assessment varies from "less than 20 per cent" up to 50 per cent; that all cases should be re-assessed in not less than six and not more than twelve months; and that such re-assessment will generally reduce the degree of disability by, say, 10 per cent or more.

TREATMENT.—The 'irritable-heart' syndrome is not solely a war product. It is always with us. Nevertheless, the number of cases due to ordinary causes is at present greatly exceeded by those arising directly, if not from service in the field, yet nevertheless from war conditions. The number of married women among the middle and working classes who have developed this disorder as a result of the anxieties of the last few years, and in many cases as a result of influenza also, is very striking.

To whatever group the patient may belong, the primary rule of treatment—remove the cause—applies with equal force. Now, as the causal factors are partly inherent in the individual, partly impressed on him from without, partly physical and partly psychical, it follows that the first duty in every case is an analysis of the causation. The inherent proclivity is not easy to detect unless one has known the patient for some time; but a history on the physical side of a weedy adolescence with inability to play games, and on the psychical of abnormalities ranging from diffidence and introspection to actual obsessions, can be taken as evidence of a make-up which has predisposed the patient to the development of the syndrome. The existence of such a factor makes the case harder to treat, and it is therefore worth while remembering it.

As for the acquired factors, so far as treatment is concerned two alone demand consideration: infection, and emotional stress. The infection may have been a transient one, as in the post-influenzal and post-enteric cases. If the syndrome persists for months after these illnesses are over, some other cause, still active and probably psychical, must be looked for. But the chronic infections, such as malaria, dysentery, tuberculosis, and trench fever (if Byam's work on the chronicity of this infection is corroborated, as seems likely), must also be looked for and treated appropriately.

Even when all allowances have been made for these infective factors, we find many patients whose symptoms we cannot attribute wholly or even principally to such causes. Indeed, there are very many of them in whose cases no infection, either past or present, can be discovered. Of course it is not possible to say that bacterial toxins play no part even in these people. There is no one whose tissues are not open to attack by toxins from the bowel and other mucous surfaces of the body, from the cradle to the grave. But these are constants, and will not account for the great incidence of the irritable-heart syndrome upon the civil population of to-day. What is it that has laid people open to these disturbances? The answer is to be found in a consideration of the times in which we live. The European of to-day has been made acquainted once more with Fear, a spectre which it was hoped had been laid by civilization. Fear of death, of bodily injury, of starvation, of separation, fear of the unknown, have become the experience, more or less, of everyone. The acuter fears of the war period have blazed paths through the patient's mentality and downward through his autonomic nervous system, and down these paths the milder fears and uncertainties of the after-war period find it easy to transmit stimuli disturbing the action of the heart and other viscera. And this sets in motion a vicious circle; for the disturbed action of the heart itself becomes a cause of fear, and thus aggravates itself.

To deal properly with this type of disturbance implies, therefore an experiment in psychotherapy. The source of the patient's anxiety must be discovered. Often it lies fairly near to the surface, and may even be known to the patient himself. Sometimes it is difficult, and a psychological analysis aimed at an unveiling of the deeper sources of the patient's anxiety is essential. Often it seems as if there were no one object of fear, but rather a permanent state of fearfulness. Whichever it is, it must be explained to the patient, and he must be helped by this means to set his mind at rest. When it is one definite anxiety that harasses him, one's duty usually resolves itself into persuading him to take some course of action that will put an end to his uncertainty. When it is, rather, an anxious state of mind, nothing but a new philosophy which defies worry can help him radically. In either case the patient will gain a great deal if he can be persuaded to keep mind and body healthily occupied. (See also NEUROSES OF WAR.)

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, i, 162; ²*The Nervous Heart* (Oxford Medical Publications, 1919); ³*Birm. Med. Rev.* 1917, lxxxi, 31; ⁴*Johns Hopkins Hosp. Bull.* 1919, 279; ⁵*Arch. Internal Med.* 1919, ii, 51; ⁶*Lancet*, 1919, i, 827, 873, 923, and 965; ⁷*Bodily Changes in Pain*, etc. (Appleton, 1915); ⁸*Amer. Jour. Med. Sci.* 1918, ii, 872; ⁹*Heart*, VII, i, 17; ¹⁰*Arch. Internal Med.* 1919, ii, 89; ¹¹*Heart*, VII, i, 1; ¹²*Ibid.* 23.

HEART AND BLOOD-VESSELS, SURGERY OF. (See VASCULAR SYSTEM.)

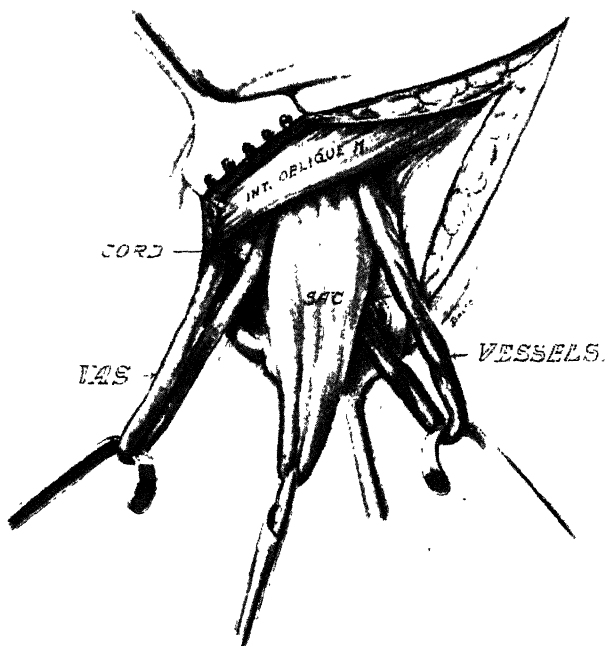
HERNIA.

E. Wyllys Andrews, A.M., M.D., F.A.C.S.

Inguinal Hernia.—Torek¹ reports a series of 294 cases of inguinal hernia operated by a method previously described by him,² with but 0.3 per cent of recurrences at the end of two years. He believes that the vas and the spermatic vessels meeting at an angle at the internal ring produce a weak spot

PLATE XVII.

LEFT OBLIQUE INGUINAL HERNIA

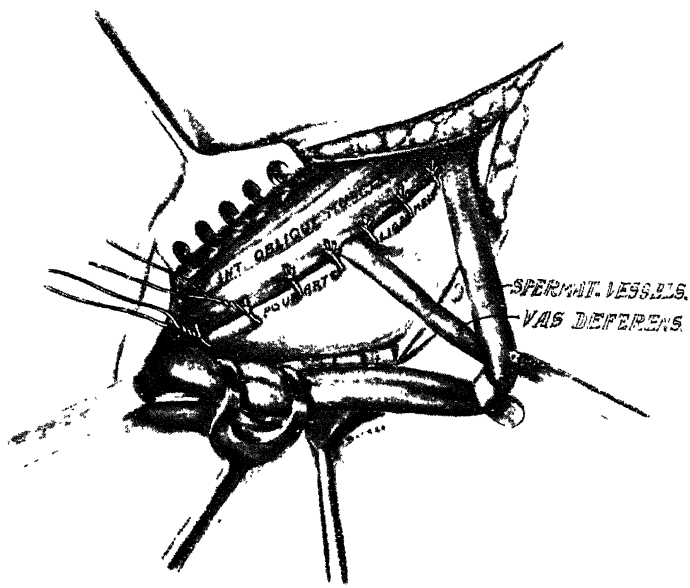


The sac emerges between the spermatic vessels and the vas deferens.

By kind permission of the 'Annals of Surgery'

PLATE XVIII.

LEFT OBLIQUE INGUINAL HERNIA—continued



Closure of the deep layer. The internal oblique and transversalis muscles have been sutured to Poupart's ligament, three of the sutures separating the vas deferens from the vessels. The vessels emerge at the uppermost angle. The two lower sutures are silver wire, the others chromicized catgut.

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between them, and that this is the site where the sac is formed (*Plate XVII and Fig. 22*). To eliminate any possibility of this happening again, he dissects the cord apart after removal of the sac, putting the vas in one bundle and the vessels in the other. Then, in closing, two or three stitches of the internal oblique and Poupart's ligament are interposed between these two bundles, thus effectively preventing any herniation between them (*Plate XVIII*).

The statistics of Hull³ and Dodge⁴ correspond with the experience of the reviewer, that oblique hernias very seldom recur where wound healing is clean, and especially when the obliquity of the canal is maintained by suturing the internal oblique underneath the cord. Practically all the recurrences are in cases in which wound infection takes place, and most of them are direct in type, emerging just above the pubic spine. The problem to-day is, how to handle the direct type. The reviewer believes that the overlapping of the external oblique aponeurosis, as previously described by him, is especially important in this class of hernia. The cord should never be left behind in these cases, because this interferes with sewing the tissues together right down to the pubic spine. In many of these instances there is a marked atrophy of the conjoined tendon, and if this is the case, the edge of the rectus should be included in our lowest stitch, and brought down to Poupart's ligament to cover the defect.

Femoral Hernia.—Fischer⁵ and Cole⁶ each report 37 cases of femoral hernia operated by the Lotheisen method. No recurrences were noted in either series.

The operation consists of exposure of the femoral ring from within through the inguinal canal. The closure is made by suturing Cooper's ligament to the lower edge of Poupart's. The advantages of this method are summed up by Cole as follows: (1) It provides a certain means of cure; (2) It permits a direct view of the essential structures; (3) Abnormal conditions can be recognized and dealt with; (4) Resection can be undertaken through the original incision; (5) It is neither difficult nor complicated.

Pages⁷ reports a case of retrograde strangulation of the omentum in a femoral hernia. This condition (*Fig. 23*), if not recognized at operation, will result in a necrotic piece of omentum being left in the peritoneal cavity. In this instance a gush of bloody fluid from the free peritoneal cavity made the operator

suspicious, and further exploration revealed a necrosis of a considerable portion of the omentum within the abdomen which was distal to the portion in the sac.

Diaphragmatic Hernia.—An unusual number of cases of diaphragmatic hernia

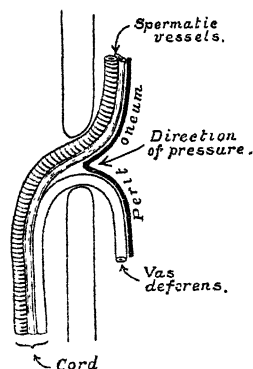


Fig. 22.—Diagram of relations of spermatic vessels and vas deferens at internal inguinal ring. Almost normal, but representing a beginning impingement of the peritoneum into the open angle of the wedge outlined by vessels and vas.

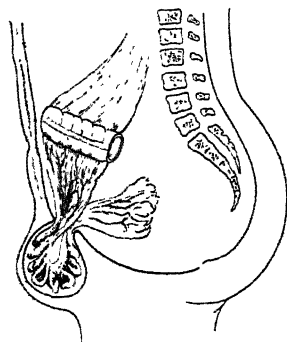


Fig. 23.—Diagrammatic representation of retrograde strangulation of the omentum.

reported recently (V. Schaldemoss,⁸ R. Warren,⁹ A. L. Soresi,¹⁰ L. Bérard and Ch. Dunet,¹¹ A. Helsted,¹² H. Panner,¹³ J. L. de Courcy,¹⁴ Oberndorfer,¹⁵ and Jehn and Nasgeli¹⁶ convinces one that this condition is more common than is ordinarily supposed, and the wealth of traumatic cases following war wounds enables us to get a much clearer picture of the symptomatology of a disease hitherto usually diagnosed only at operation or post mortem. The characteristic sign is a peculiar combination of abdominal pain usually referred to the umbilical region, with a moderate respiratory embarrassment. The respirations are shallow and slightly increased in rate, and deep inspiration causes acute pain and often dizziness. The patient becomes very nervous. Vomiting is an early sign, as the stomach is generally the herniated organ, and emaciation is soon evident. As the hernia grows in size, signs of partial obstruction come on. It is only in advanced cases that the classical radiographic and physical signs in the chest are of value. With the combination of umbilical pain, respiratory embarrassment, and vomiting, we should institute special methods of radiography to demonstrate the air-bubble or barium shadow of a small herniation of the stomach. (Cf. *Plate III* and p. 21.) The abdominal route seems to offer the best operative access, but in large or adherent hernias a thoracotomy may be necessary as well.

REFERENCES.—¹*Ann. Surg.* 1919, July, 65; ²*Med. Rec.* 1918, June 22; ³*Jour. R.A.M.C.* 1919, xxxii, 152; ⁴*Mil. Surgeon*, 1919, xiv, 385; ⁵*Ann. Surg.* 1919, April, 482; ⁶*Brit. Med. Jour.* 1919, i, 768; ⁷*Rev. Esp. de Med. y Cir.* 1919, Jan., 21; ⁸*Hospitalstidende*, 1918, June 26; ⁹*Lancet*, 1919, i, 1069; ¹⁰*Ann. Surg.* 1919, March, 254; ¹¹*Lyon Chir.* 1918, Sept.-Oct., 509; ¹²*Hospitalstidende*, 1918, July 3, 881; ¹³*Ibid.* 890; ¹⁴*Ann. Surg.* 1919, Aug., 179; ¹⁵*Münch. med. Woch.* 1918, Dec. 17, 1426; ¹⁶*Ibid.* 1429.

HERPES FEBRILIS.

E. Graham Little, M.D., F.R.C.P.

Lowenstein¹ has made important researches into the etiology of herpes febrilis. He quotes the results of Schottmuller, who, in 50 cases of genito-urinary disease in women who showed also herpes febrilis, found a rich abundance of coli bacilli, but not in the vesicles. The author establishes from his own researches the following conclusions. The contents of the vesicles from herpes of the lip, chin, forehead, and ear, were inoculated into the corneæ of fourteen rabbits. Twenty-four hours afterwards, in the site of the abrasions, fine vesicles visible with a lens had developed, and thirty-six hours afterwards there was ciliary injection, with soft dark blisters appearing at the edges of the scratches on the cornea made by the inoculation. The lids were stuck together by discharge, and there was photophobia. Later there were anæsthesia of the cornea and loss of reflexes. In eight to ten days there was a pannus-like new formation of vessels. There was much scarring. Experiments were then conducted as to the nature of the virus. The contents of several vesicles were introduced into normal saline solution, diluted to 20 c.c., and this very weak dilution was found to infect a rabbit's eye with the characteristic disease. Control experiments with the contents of blisters produced by simple burns and from an acute eczematous eruption did not cause any reaction when inoculated into the corneæ of rabbits. The virus is therefore a specific virus. It was found to be destroyed by a temperature of 56°, and to be arrested by a Berkefeld filter. With Giemsa's stain of the contents of the herpetic vesicle, elementary bodies were found like those described by Lipschutz in vaccinia and molluscum contagiosum. By no investigation could any bacteria be identified, aerobically or anaerobically, and the blood of herpetic patients inoculated into the corneæ of rabbits produced no effect.

REFERENCE.—¹*Münch. med. Woch.* 1919, July 11, 769.

HOOKWORM DISEASE. (*See* ANKYLOSTOMIASIS, p. 42; and GELATIN CAPSULES, p. 7.)**HYDROCEPHALUS.***J. Ramsay Hunt, M.D.*

Dandy¹ has continued the investigations on *experimental hydrocephalus* which were begun in 1913 with Blackfan. His results are in many ways startling, and will do much to clarify this obscure and important field. They may be summarized as follows: Hydrocephalus has been produced by placing an obstruction in the aqueduct of Sylvius; dilatation of the third and both lateral ventricles results. One foramen of Monro has been occluded; this is followed by a unilateral hydrocephalus. If the choroid plexus of one lateral ventricle is completely removed at the time the foramen of Monro is occluded, not only does no dilatation occur, but the entire lateral ventricle collapses. This is the only absolute proof that the cerebrospinal fluid is formed from the choroid plexus. At the same time it proves that the ependyma does not secrete cerebrospinal fluid. If the choroid plexus of both lateral ventricles is removed, and an obstruction is placed in the aqueduct of Sylvius, hydrocephalus still results in the third and both lateral ventricles, but at a reduced rate. The fluid forms from the choroid plexus of the third ventricle, but cannot escape into the subarachnoid space. Cerebrospinal fluid forms in all the cerebral ventricles. It is absorbed almost entirely in the subarachnoid space. The sole communication between the ventricular system and the subarachnoid space is through the foramina of Luschka and the median foramen of Magendie. The phenolsulphonaphthalein test will prove conclusively whether the foramina of Luschka and Magendie are open or closed. Closure of these foramina invariably causes hydrocephalus. Hydrocephalus follows ligation of the vena magna Galeni if the ligature is placed at the origin of this vein. Ligatures beyond or in the sinus rectus have no effect, because there is sufficient venous collateral circulation. The communicating type of hydrocephalus has been produced in dogs by a perimesencephalic band of gauze, saturated in an irritant which induces adhesions. This obstruction prevents the cerebrospinal fluid from reaching the cerebral subarachnoid space, where most of this fluid is absorbed. The resultant diminished absorption of fluid results in hydrocephalus. Hydrocephalus follows the ligation of the great vein of Galen because of an overproduction of cerebrospinal fluid. In other types of hydrocephalus, both obstructive and communicating, the accumulation of fluid is due to a diminished absorption of cerebrospinal fluid.

REFERENCE.—¹*Ann. Surg.* 1919, Aug.

HYSTERIA AND ORGANIC AFFECTIONS OF THE NERVOUS SYSTEM.*J. Ramsay Hunt, M.D.*

Hurst and Symms¹ present some interesting observations on the hysterical element in organic disease and injury of the central nervous system. It has long been recognized that hysterical symptoms may be grafted upon symptoms caused by organic disease. Our experience with soldiers during the past four years has led us to believe that this association is much more common than has generally been supposed. We would even go so far as to say that there are few symptoms caused by organic disease which are not liable to be exaggerated and perpetuated by suggestion, so that it becomes necessary in almost every case of impaired function to look for a hysterical element which can be removed by psychotherapy. Hurst and Symms found that hysteria may account for a large proportion of the incapacity in a patient presenting such definite signs of organic disease that it might very easily have been presumed that the entire condition was organic. They are consequently now in the habit of testing

every case in which it is at all conceivable that a hysterical element is present, by the only means which can yield the necessary information—namely, by observing the effect of the psychotherapy. No other means are available, as, on the one hand, organic physical signs do not exclude the possibility of hysterical symptoms being present, and, on the other hand, their observations, as well as those of other investigators, have proved that the supposed stigmata of hysteria are not present until they have developed as a result of the unconscious suggestion of the observer, who may produce them in suggestible individuals suffering from organic disease just as easily as in those suffering from hysterical disorders.

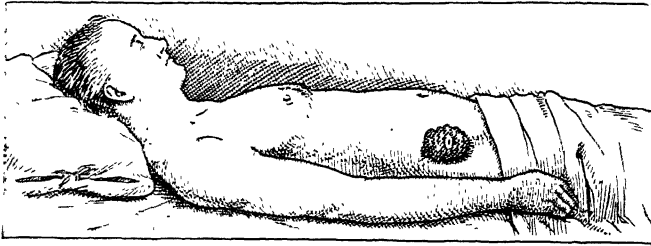
Disseminated Sclerosis.—Many patients suffering from disseminated sclerosis have a peculiar state of mind, often erroneously called hysterical, one feature of which is an abnormal degree of suggestibility. It is not surprising, therefore, that hysterical symptoms—symptoms produced by suggestion and curable by psychotherapy—may develop. This they believe to be the chief explanation of the occurrence of periods of more or less spontaneous improvement which is such a characteristic feature of disseminated sclerosis. It applies equally to improvement of other symptoms, such as amaurosis; the slight impairment of vision, which results from the earliest changes in the optic nerves, sometimes even before any change can be recognized in the discs, suggests a grave loss of vision to suggestible individuals, so that almost complete blindness may take place long before definite optic atrophy is present. The vision may greatly improve again, either spontaneously or as the apparent result of some form of treatment, but really as a result of suggestion. Their explanation also makes it easy to understand why spontaneous improvement occurs more often in females than in males, and in the neurotic than in less suggestible individuals.

Tabes.—They have seen numerous cases in which much of the incapacity in a man obviously suffering from tabes was proved to be hysterical by its rapid disappearance with psychotherapy, the symptoms having been suggested to the patient by the slight incapacity which resulted from the actual organic disease. In addition to this auto-suggestion, hetero-suggestion often plays a part, symptoms being unconsciously suggested by the medical officer in the course of his examination. It is, for example, very easy to suggest Romberg's sign, and they have seen a number of cases in which a well-marked Romberg's sign was obviously hysterical. The improvement in the gait of tabetic patients which results from the methods devised by Fraenkel does not, in their opinion, always act solely by educating the patient to use his eyes to help his deficient muscle-sense, and to make the most of such muscle-sense as he still has. The results obtained are sometimes too rapid and too dramatic, and can scarcely be explained except as a result of suggestion, the inco-ordination being largely hysterical, and the nature of the incapacity having been suggested by the slight degree of unsteadiness actually caused by the organic disease.

Injuries and Acute Diseases of Brain and Spinal Cord.—Just as the physical signs of an organic lesion of the pyramidal tract may precede the development of paralysis due to the lesion, and may be associated with hysterical paralysis, persisting after the cure of the latter by psychotherapy, so may these physical signs persist after recovery from organic paralysis and be associated with hysterical paralysis which develops as the organic symptoms disappear. In the majority of cases the gradual improvement in the actual lesion is accompanied by a corresponding functional improvement. Occasionally, however, especially among suggestible individuals, such as soldiers who are mentally and physically exhausted as a result of the stress and strain of active service, the patient may not realize that the lost functions are returning. The initial incapacity gives rise to the idea of permanent incapacity by auto-suggestion,

PLATE XIX.

THE ILEOCÆCAL VALVE



A. Rendle Short from the 'New Physiology in Surgical and General Practice'

often aided by the unconscious hetero-suggestion of the physician, and whilst a less suggestible man might recover the use of his paralyzed limbs in a few days, the paralysis is perpetuated in the suggestible man by the development of a hysterical element, which has been produced by suggestion and which can be removed by psychotherapy. *A condition may thus occur which is primarily organic, but is ultimately hysterical. Everything of organic origin may disappear, or the residual lesion may be sufficient to produce organic signs without any loss of function, or both organic physical signs and some loss of function.*

TREATMENT.—There is a widespread tendency to adopt a waiting attitude in the treatment of *acute* organic nervous diseases, which is sound if confined to the early stages, but becomes dangerous if it is continued for a longer period. The natural tendency of most acute diseases is towards recovery; but the functional capacity does not always tend to return *pari passu* with structural recovery, unless the physician makes use of **Psychotherapy in combination with Re-education** from the earliest possible moment. In organic hemiplegia following a head wound or an acute vascular lesion, there is no reason why passive movements should not be commenced on the day of onset, and as soon as the patient's general condition permits he should be encouraged to attempt voluntary movements. When the hemiplegia is associated with aphasia, re-education of speech should be begun at the same time. Treatment of this kind, in which psychotherapy is preventive rather than curative, is extremely important, and leads to a maximum of recovery in a minimum of time. The same is true in such conditions as acute poliomyelitis, in which there is often too great a tendency to rely upon mechanical means, such as massage and electricity, and to forget the psychical side. The paper is concluded by reports of illustrative cases.

REFERENCE.—¹*Lancet*, 1919, i, 369.

ILEOCÆCAL VALVE, THE.

A. Rendle Short, M.D., F.R.C.S.

The illustration (*Plate XIX*) shows the ileocæcal valve, or sphincter as it should be called, exposed on the surface in a case described by Rendle Short.¹ Eighteen months before the patient came under observation, a cæcostomy had been performed for dysenteric colitis; but the whole cæcum had prolapsed through the wound and turned inside out, so that there was a projecting swelling composed of the thin wall of the cæcum, with the mucosa turned out on the surface, stretched over coils of ileum, rendered visible beneath the cæcal wall by their incessant peristalsis, which never ceased. On the surface of the mass the ileocæcal orifice can be seen, guarded by a sphincter. Ordinarily the sphincter is tightly closed (A), and does not relax for hours at a time. Within a few minutes of taking food, the sphincter becomes patulous, and gushes of liquid fecal matter are ejected by the peristalsis of the ileum, a tablespoonful or two at a time, at intervals of a minute or so (B). This goes on for about half an hour. The application of acids or alkalies to the cæcal mucosa does not alter the efflux. Local stimulation, as by pinching, delays it somewhat. This is interesting in relation to the theory that appendicular gastralgia and flatulence may be due to reflex delay at the ileocæcal and pyloric sphincters.

Somewhat similar cases have been described by Macewen and by Rutherford,² but they do not comment on the remarkably close relation of the efflux to taking food.

REFERENCES.—¹*Brit. Med. Jour.* 1919, ii, 164; ²*The Ileocæcal Valve*, 1914.

ILEUS. Value of transduodenal lavage in cases of post-operative ileus (see p. 9).

IMPETIGO.*E. Graham Little, M.D., F.R.C.P.*

Dobihal¹ recommends the application of compresses of $\frac{1}{4}$ per cent solution of **Potassium Permanganate** applied twice daily without removing the crusts, and kept in position with bandages. It is claimed that healing is effected within fourteen days.

Copper Sulphate is recommended by Hérain (*see p. 6*).

REFERENCE.—¹*Med. Sup. Rev. Foreign Press*, 1919, Jan., 31.

INFANT FEEDING. (*See also DEFICIENCY DISEASES; INFANTS, PREMATURE; RICKETS; SCURVY; VITAMINES.*) *Frederick Langmead, M.D., F.R.C.P.*

As J. C. Drummond¹ points out, our knowledge of the dietary requirements of the human organism has advanced rapidly during the last decade and led to the abandonment of many beliefs. It is now generally accepted that proteins, fats, carbohydrates, and inorganic salts are insufficient to satisfy the needs of the animal for growth and maintenance of health, and that there exist a number of other indispensable dietary components. These components, called by Funk 'vitamines', but better termed 'accessory factors of diet', have recently received considerable attention. So far, the existence of three has been detected, and they have been given the provisional names of *fat-soluble A*, *water-soluble B*, and *water-soluble C*. Absence of the first from the dietary leads in infancy to rickets, and of the third to scurvy, whilst absence of the second precedes beri-beri.

Fat-soluble A (sometimes termed anti-rachitic vitamine) is synthesized by plants, and is found in most green leaves and in the embryos of certain cereals. When liberated by digestion it shows similar solubilities to the fats and lipoids, and accompanies these substances during absorption. The growing animal demands a liberal supply of this factor, but an adult can maintain good health upon a much smaller quantity. Probably any excess is stored in company with depôt-fat. Young animals deprived of this factor sooner or later cease to grow, and exhibit a greatly impaired resistance to disease which usually results in early death from acute infections. Prompt correction of the diet by including some foodstuff containing an ample amount of *fat-soluble A* leads to a more or less rapid recovery of health, and resumption of the normal rate of growth.

Water-soluble B is probably identical with what has been termed the anti-beri-beri vitamine. Long before beri-beri occurs, however, retardation or inhibition of growth may be detected. Young animals cease to grow altogether when deprived of this factor. Again, the animal is dependent upon the vegetable kingdom for its supplies. Cereal embryos and yeast are the richest known sources among the natural foodstuffs.

Water-soluble C, or the antiscorbutic factor, is probably indispensable to all growing animals, but many species are very little susceptible to scurvy, and therefore require but small amounts.

The following tables indicate the chief properties of the three substances, and give a short guide as to their distribution in natural foodstuffs.

During the last few years Drummond has done much experimental work on the influence of accessory substances upon the nutrition of young growing animals, employing rats for the purpose. The experiments have demonstrated the absolute indispensability of an adequate supply of the accessory food factors during the period of growth, the demand being probably greatest during the period of most active growth, i.e., during very early life. A very slight inadequacy operating over a considerable period may be the cause of an apparently insignificant, but in reality very serious, disturbance of the health of the growing child, the effects of which may be marked long after the deficiency has been corrected.

Table I.—STABILITY OF ACCESSORY FACTORS IN NATURAL FOODSTUFFS.

A = Fat-soluble A. B = Water-soluble B, or anti-beri-beri factor. C = Water-soluble C, or antiscorbutic factor.

Stability	A.	B.	C.
To temperature	Stable at 100° C., probably stable at 140° C.	Comparatively stable at 100° C. Slowly destroyed at 120° C. and above	Gradually destroyed above 50° C. Rapidly destroyed above 80° C.
To alkalis ..	Stable in cold, possibly stable when hot	Slowly destroyed in cold. Rapidly destroyed when hot	Rapidly destroyed even when cold.
To acids ..	Probably stable ..	Comparatively stable	Comparatively stable below 50° C.

Table II.—DISTRIBUTION OF ACCESSORY FACTORS IN NATURAL FOODSTUFFS.

A = Fat-soluble A. B = Water-soluble B, or anti-beri-beri factor. C = Water-soluble C, or antiscorbutic factor.

Foodstuff.	A	B	C	Foodstuff.	A	B	C
Milk	++	++	+	Fish-body oils ..	++	—	—
Butter	++	++	—	Wheat, whole grain ..	++	++	—
Cream	++	++	+	Wheat, embryo ..	++	+++	—
Separated milk ..	—	++	+	Wheat, endosperm ..	—	—	—
Whey	—	++	+	Wheat, bran ..	—	+	—
Egg yolk	++	+	?	Rice, polished ..	—	—	—
„ white	—	+	?	„ whole grain ..	+	++	—
Beef fat	++	—	—	White bread ..	—	—	—
Lard	—	—	—	Wholemeal bread ..	+	++	—
Vegetable oils ..	—	—	—	Yeast, dried ..	+	+++	—
Animal fat, mar-				Yeast, extract (com-			
garines	+	—	—	mercial)	—	+++	—
Vegetable oil, mar-				Cabbage.. fresh ..	++	+	+++
garines	—	—	—	„ dried ..	++	+	—
Lean meat	—	—	+	Spinach	++	+	+++
Liver	++	++	—	Potatoes	—	+	++
Heart, kidneys ..	+	+	—	Oranges	—	—	+++
Pancreas	+	++	—	Tomatoes	?	+	?
Brain	+	++	—	Onions	—	—	+++
'Lean' fish—e.g., cod	—	+	+	Apples (green) ..	?	—	+++
'Fat' fish—e.g.,				Lettuces	+	—	+++
herring	+	+	—	Peas, dry	?	+	—
Fish roe	+	++	—	„ fresh	+	+	+++
Cod-liver oil ..	+++	—	—	Malt extract ..	—	—	?

An attempt is made to give an idea of the relative values of foodstuffs containing the factors by employing more than one positive sign. A negative sign indicates the absence of a factor; an interrogation mark shows either a doubtful result or that no investigation has been made.

Experimental research has shown that the nursing mother is dependent upon her own food-supply to provide her young with the accessory factors. Only in the case of fat-soluble A can she indirectly make good an inadequacy of accessory factors, and then only to the extent of calling up any reserves of that factor which she may possess. An adequate supply of the accessory factors in the dietaries of nursing and expectant mothers is therefore vitally important. Without it two results follow. First, what she does receive probably goes into her milk, so that she herself suffers the effects of a very serious deficiency; and, secondly, the young, in spite of the maternal sacrifice, receive an amount

insufficient for normal nutrition. This observation is all the more important since there is considerable danger that the cost of the chief foods which serve as sources of *fat-soluble A*—milk, butter, and eggs—may lead many mothers to attempt to nurse their infants while themselves receiving a dietary more or less deficient in that factor. By following the results of feeding rats upon such diets, he believes that they explain certain types of malnutrition so common among the working classes, and suggests that much of the low resistance to disease shown in consequence is due, not to any deficiency of protein or calories, but to their having received, during a critical period of their development, an inadequate supply of one or more of the indispensable accessory factors. Fortunately our varied diet precludes any great danger of infantile beri-beri from deficiency of *water-soluble B*; yet we should ensure an adequate supply to the nursing mother. Equally important is it to provide the nursing through its mother's milk with sufficient *water-soluble C*, for failure to do so may cause serious damage to health, perhaps with life-long effects, although the deficiency of the factor may not be so great as to produce typical scurvy.

ARTIFICIAL FEEDING.—With regard to *artificial feeding* the same considerations must be borne in mind. Since the rate of growth of the calf is greater than that of the child, it is probable that cow's milk is a source of accessory food factors, adequate for the infant. This is less certain in the case of *water-soluble C*, since the cow probably represents a species little susceptible to scurvy, and therefore with little antiscorbutic element in its milk. For this reason it is wise to administer **Orange-juice** occasionally to infants fed on cow's milk. When modifying cow's milk for infant feeding, calculations solely in terms of protein, carbohydrate fat, and salts, must now be discarded, for full account must be taken of the accessory food factors. If the modification of the milk is carried out only with products derived from milk there is little danger, and true success will only be achieved by employing such units as cream and whey. Too little attention is frequently paid to the source of fat used in modifying milk. Thus the addition of Marylebone cream, which is an emulsion of linseed oil and olive oil, both of which are vegetable oils, results in the production of a food seriously deficient in *fat-soluble A*. [We understand that the composition of Marylebone cream has now been changed to meet this criticism.—F. L.]

The majority of *dried milk* is prepared by one or other of two processes, the 'drum' and the 'spray' processes respectively. In the former the exposure to a high temperature is probably insufficient to cause any appreciable destruction of factors *A* and *B*, but the antiscorbutic principle may suffer. In the spraying processes, however, the dried milk powder remains in a chamber heated by a current of air at 115° C. If this period extends over an hour or two, a certain amount of destruction of the water-soluble growth factor may result. Most *condensed milks* are prepared by processes which should effect an inappreciable destruction of factor *B*, and unsweetened condensed whole milk should, when properly diluted, be an adequate source of the two factors *A* and *B*. There is considerable danger in the employment of the other forms of condensed milk. Their use is discouraged on the ground that, when diluted according to the directions, they are seriously deficient in fat. The symptoms described as following the use of fat-deficient foods are closely similar to those which are now associated with deficiency of *fat-soluble A*. Drummond believes the nutritive failure is due, not to the deficiency of the fat itself, but to the restricted supply of the accompanying accessory factor; and that correction of the fat deficiency by adding a fat which does not contain the accessory would effect little if any improvement, whereas the employment of a suitable fat, such as butter or cod-liver oil, would soon restore the subject to health.

Proprietary infant foods, from their composition, must in many cases be seriously deficient in accessory factors *A* and *B*, but particularly in the former. Many are fat-deficient, and therefore equally deficient in the indispensable accompaniment of milk-fat. This affords a partial explanation of the liability to infection frequently shown by the fat but pasty baby reared upon this kind of food. Such diets should be supplemented by rich supplies of this factor in the form of cream or cod-liver oil, otherwise malnutrition will inevitably follow.

G. D. Laing² criticizes the *quantity of milk* usually given to infants, and the modern plan of allowing three-hourly or four-hourly intervals between the feeds. The quantity, he says, which a young healthy infant obtains from its mother's breast is about $2\frac{1}{2}$ to 3 oz., whereas the amount given during the first week is usually $1\frac{1}{2}$ oz., and during the second, 2 oz. It appears unreasonable to give an infant less food than it would get from a healthy mother. He is of opinion that bottle-fed babies make better progress if the intervals are short. No hard-and-fast rule can be laid down as to the quantity of food an infant should be allowed, irrespective of its size, weight, and appetite. He recommends that the baby should be put to the breast from twelve to sixteen hours after birth, and then every six hours until the milk comes. Afterwards the baby should be fed at least every two hours from 8 a.m. to 10 p.m. After 10 p.m. he is allowed to sleep as long as he will, but usually has to be fed once or perhaps twice between 10 p.m. and 8 a.m. After the first two or three weeks, the baby will often sleep six or eight hours at a stretch if he has had enough food in the daytime. In some cases where the baby is small and weak, can only take a little food at a time, and wakes and cries within two hours, he is fed every hour and a half for the first seven days or even longer. At about the third or fourth month Laing advocates three-hourly feeds, but this depends on the comfort of the mother and the appetite of the baby, and must not be a hard-and-fast rule.

In *bottle-feeding*, Laing recommends practically the same times for the meals. Enough must be given to satisfy the infant, and the best way to ensure this is to put enough of the mixture in the bottle, let the baby have it for twenty to thirty minutes and then take it away. If the baby finishes every bottle it is fairly certain that it is not having enough, for a baby, like an adult, takes more at one meal than another. The actual quantity varies greatly. Nine feeds in the twenty-four hours, with an average of $2\frac{1}{2}$ oz. in each feed, amounts to $22\frac{1}{2}$ oz. in all, and is a not uncommon quantity for an 8-lb. or 9-lb. baby to take; but some require even more. It is difficult to overfeed a baby provided that the strength of the mixture is right, the hole in the teat not too large, and the baby not allowed to suck too long. A baby at the breast takes as much as he wants, and only leaves off when he is satisfied; a baby at the bottle should do the same.

G. H. Hickling³ agrees that the baby at the breast should be allowed to suck as long as it likes, provided that it be not allowed to use the nipple as a 'dummy' to go to sleep with. With the bottle-fed baby, however, she considers that the feeds must be regulated. In practice it is difficult to get a teat with a suitable bore; should one succeed, a few days' use enlarges the hole, and in consequence the feed is gulped down so rapidly that no feeling of satisfaction results. Less frequently the bore is too small, and the infant becomes tired with sucking before the full ration is taken. In the course of nine years' experience at schools for mothers and infants' consultations she has become convinced of the advantages of three-hourly intervals and no feeds at night. Flatulence is usually attributable to too frequent or irregular feeds, and once the infant has adopted the three-hourly routine the trouble may disappear,

if the bowels are kept regular. The method allows time for sufficient sleep between feeds, and, if there is a waking interval before the next meal-time arrives, a suitable opportunity is afforded for exercise. The habit of sleeping all night without a feed is readily acquired if insisted upon from the first, and the long rest benefits both the mother and the child. Two-hourly feeding is impracticable for a hard-worked mother; a three-hourly plan she can attempt to follow. A steady gain in weight can generally be obtained by the three-hourly method, provided the food be adapted to the individual.

S. B. Jackson⁴ has also had good results from three-hourly feeding. No symptoms of starvation were detectable, and infants suffering from dyspepsia and loss of weight on two-hourly feeds have begun to gain weight the first week after the interval has been lengthened to three or four hours. This writer is convinced that babies make the best progress when kept eight hours at night without a feed from the first.

A. B. Marfan⁵ emphasizes the need for being on the alert to detect the digestive disturbances which sometimes occur when cow's milk is substituted for breast milk. The principal symptom is a putty-like stool which scarcely soils the diaper. Pieces of mucus on the surface, large bulk, strong alkaline reaction, and an ammoniacal and putrid odour are also special features. The stools contain an excess of alkaline-earthly soaps and of minerals—evidences of incomplete digestion of casein. When the child is under six months old, if breast milk and hygienic conditions are not available, the prognosis is almost always fatal. Omitting the cow's milk, or sometimes its further dilution, leads to cessation of the dyspepsia. Even when the child is apparently thriving on cow's milk, the appearance of the characteristic stools indicates that disorder of digestion is to be feared. In treatment, if breast milk is not available, ass's milk is the next choice, and falling this, buttermilk, condensed milk, or sweetened skimmed milk. Each of these, even breast milk, must be given in small quantities at first.

REFERENCES.—¹*Lancet*, 1918, ii, 482; ²*Brit. Med. Jour.* 1919, i, 150; ³*Ibid.* 1919, i, 231; ⁴*Ibid.*, 412; ⁵*Paris Méd.* 1919, Jan. 4, 9, in *Jour. Amer. Med. Assoc.*, 1919, Feb. 22, 612.

INFANTS, PREMATURE.

Frederick Langmead, M.D., F.R.C.P.

Rood Taylor¹ gives his experience of the treatment of 60 prematurely-born infants at the University of Minnesota Hospital. It showed the value of four-hourly feeding. There was only one real disadvantage, namely, that in certain homes where insufficient care is taken to empty the breasts thoroughly, they are inadequately stimulated and the milk supply suffers in consequence. The babies were fed on breast-milk every four hours, and no other food was used, except in a few instances in the second month. Many were fed by a tube as advised by Farnier. The tube, a small soft rubber catheter, attached to a glass funnel, was passed by the mouth and inserted about 15 cm. No injury ever resulted. The tube-feeding was continued until the babies were able to take the breast or bottle successfully. The smaller babies accomplished this, as a rule, at the end of the first month. Two-thirds of the infants with a birth-weight of more than about $4\frac{1}{2}$ lb. took the breast satisfactorily in the first week. After being put on the breast, nearly half of the babies required supplementary feeds for a week or two longer; they were weighed before and after feeding, and the deficiency was made up by tube or bottle. The milk supply from the mothers was kept up by manual compression or the pump, many of them sending in their milk twice a day by a messenger.

Feeding, as a rule, was begun on the second day, the initial amounts being usually from about $\frac{1}{2}$ oz. to 1 oz., six times in the twenty-four hours. No average amount was found to be applicable to the individual, the chief point

to be remembered being that the infant's tolerance for food must not be overstepped. Vomiting seems to be the first danger signal.

Incubators were not used. Instead, the babies, clad in flannel hoods and capes, were kept in blanket-lined clothes-baskets containing hot-water bottles. The bed temperatures were charted at the same time as those of the infants, and were kept at between 85° and 90°.

Of the 60 premature infants, 24 died. Fourteen of the deaths, however, occurred on the first day. Autopsies were done on 12 of these, and adequate causes for death were found. There was extensive visceral syphilis in 2, anencephalis in 1, and a fractured dorsal vertebra with a lacerated spinal cord in 1. Two died on the second day, 1 on the third, 1 on the fifth, and 1 on the sixth, all with cyanosis and a gradual decline of body temperature. One infant survived until the eighth and another until the thirteenth day. No satisfactory cause of death was found in 5 of these 7 cases; the other 2 were not examined. Of the remaining 39 babies, 1 with syphilis died on the twenty-fifth day from hæmatemesis, and 1 on the forty-second day because his tolerance for breast-milk had been overstepped. The only other death occurred on the fifty-first day, after rhinitis. Fifteen of those who survived weighed at birth 4½ lb. or less. The babies were bathed with olive oil and wiped dry with warm flannel. An aseptic technique was adopted, nurses and doctors washing their hands before and after contact with the infants, and wearing gauze masks if suffering from any respiratory affection, however mild. The mothers also wore masks when nursing their babies, if they showed the slightest sign of coryza.

M. Reber's² experience at the Basel Infant Asylum with 150 prematurely-born infants shows that it is possible for such infants to thrive even when their weights are only about 2½ lb. The prematurely-born children of parents with tuberculosis or syphilis all died, as generally did also those with protracted jaundice or attacks of asphyxia. About 20 per cent of the infants were twins. Those infants who survived developed into healthy children of average weight and stature and average hæmoglobin percentage. No incubators were used, but the infants were kept warm in bed by hot-water bottles, their heads being covered with cotton-padded hoods. The temperature was very carefully controlled. He found buttermilk useful in the first weeks when the supply of breast-milk was inadequate.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, ii, 1123; ²*Cor.-Blatt. f. Schweiz. Aerzte*, Basel, 1918, 48, July 6, No. 27, 897, in *Jour. Amer. Med. Assoc.* 1918, ii, 933.

INFECTIVE JAUNDICE. (See JAUNDICE, INFECTIVE.)

INFLUENZA. (See also ALOPECIA, INFLUENZAL; EMPYEMA; EPILEPSY; MENTAL DISEASES—THE INFLUENZAL PSYCHOSES; PUBLIC HEALTH ADMINISTRATION.)
J. D. Rolleston, M.D.

EPIDEMIOLOGY.—W. H. Frost¹ points out that the epidemic in British cities has so far manifested three distinct waves, the first and slightest in point of mortality occurring in June and July, the second and most severe in November, and the third in February and March. The course of the epidemic in Western Europe generally was similar. In the cities of India the sequence was similar, but the mortality far greater. According to E. S. Phipson,² among 300,000 cases which occurred among the civilian population of Bombay in June to July 1918, there were 1640 deaths, or a mortality of 5 per cent. In the United States the epidemic developed in a single wave during September, October, and November. Rural districts were usually attacked somewhat later than large cities in the same sections. The deaths attributable to the epidemic among

the civilian population of the United States are stated by Frost to be not less than 450,000, or more than 4 per thousand.

G. A. Soper,³ comparing the recent pandemic with others, states that in 1889-90 no less than 25 per cent of the population were attacked in London, 33 per cent in Antwerp, 39 per cent in Massachusetts, and 50 per cent in Paris. In 1872 three-quarters of the population of London and some German cities were supposed to have been affected. In the 1918 epidemic, about 20 per cent of the soldiers in the United States camps contracted the disease.

According to Lederer,⁴ the civilian population, numbering about 2800, in a remote place in the Balkans, nearly all contracted influenza in the recent epidemic, and about 300 died, a mortality of over 10 per cent. The epidemic appeared very suddenly, and subsided after five weeks. Its severity was attributed to the fact that the district, owing to its geographical position and absence of means of communication, was unaffected by the epidemic of 1889-91, and consequently the population possessed no immunity of any kind, all ages being affected, from infancy to old age.

BACTERIOLOGY.—W. J. MacNeal⁵ states that, in the American Expeditionary Force, Pfeiffer's bacillus was demonstrated in a very large percentage of the cases properly examined; in several series it was found in every case. The other bacteria isolated—viz., streptococci, pneumococci, and Gram-negative cocci—although undoubtedly the cause of death in many cases, could be excluded as the primary cause of the disease because of the inconstancy with which one specific type was encountered.

W. J. Wilson and P. Steer⁶ cultivated *B. influenzae* from 20 out of 24 specimens of sputum, and obtained cultures of this organism 57 times from 72 swabs from the bronchi, 12 times from 71 specimens of heart blood, 3 times from 8 pleural fluids, and once from 7 pieces of lung substance. The post-mortem examinations were never made later than twenty-four hours after death. The writers conclude that *B. influenzae* acts as a pioneer and prepares the way for pneumococci, staphylococci, and streptococci, which are able to grow and multiply in the damaged mucous membrane of the bronchi, and subsequently invade the lungs and even the blood.

In the post-mortem examination of 36 men who had died from bronchopneumonia following influenza, W. Fletcher⁷ found that Gram-negative cocci were the predominant organisms in the lungs of 11 cases. In 6 cases these cocci were Type II meningococci, in 1 case they belonged to Type I, and in 4 they were not tested by agglutination. In each case Pfeiffer's bacillus was found in symbiosis with the Gram-negative cocci. Fletcher concludes that the meningococcus, like other respiratory organisms, may in conjunction with *B. influenzae* produce a fatal bronchopneumonia.

Experiments which had previously been performed on monkeys, indicating that the infective agent of influenza is a filter-passing organism (see MEDICAL ANNUAL, 1919, p. 203), have recently been carried out on human volunteers by T. Yamanouchi, K. Sakakami, and S. Iwashima,⁸ who summarize their investigations as follows: (1) The germ of influenza cannot be removed by filtering; (2) The germs can infect through the mucous membranes and also by inoculation; (3) The germs can be found in the sputum and blood of the influenza patients; (4) The known bacilli, such as Pfeiffer's bacillus, pneumococci, and some diplococci, are not the cause of influenza; (5) All persons who had previously had influenza and had received the sputa emulsion or its filtrate are immune to the disease.

MORBID ANATOMY.—B. Lucke, T. Wight, and E. Kime⁹ state that the most general changes produced by influenza are pronounced congestions, hæmorrhages, toxic degenerative lesions, and hæmorrhagic inflammations. Hyper-

œmia and hæmorrhages are specially striking in the meninges, brain, serous membranes, skin, lungs, spleen, liver, and kidneys. Examples of toxic degeneration are Zenker's hyaline degeneration of the rectus muscles, hyaline thrombosis, hyaline degeneration of the vascular walls and germinal centres of the spleen follicles, focal necrosis of the liver, pancreas, and suprarenals, toxic ganglionic changes and œdema in the nervous system, and cloudy swelling of the parenchymatous organs. Hæmorrhagic inflammations are exemplified in early pneumonia and pachymeningitis. Productive inflammations are uncommon, and confined to the later stages of the disease.

According to Rood,¹⁰ influenzal pneumonia presents a widely extended hæmorrhagic exudate into the alveolar spaces, which in prolonged cases progresses to confluent consolidated areas. The extent of the consolidation depends upon three factors: (1) The type of the secondary bacterial invasion; (2) The length of time the pneumonia has been in progress; and (3) The virulence of the primary attack. The lower lobes are usually affected most extensively; the upper lobes also present the same type of lesions, but usually not the same degree of involvement. The middle lobe of the right lung escapes more frequently than any other, probably owing to its anatomical position.

SYMPTOMS.—J. A. Abt¹¹ reports a case of influenza in a *new-born infant*, whose mother had contracted the disease within two weeks of term and was delivered the following day. At birth the infant gave symptoms of respiratory infection, which grew rapidly worse, and led to death on the third day. The necropsy showed a generalized infection, with minute hæmorrhages in the pericardium, septic endocarditis, and hæmorrhagic bronchopneumonia. Streptococci were obtained in abundance from the lungs, liver, and spleen. According to Achard,¹² influenza in the infant is by no means exceptional. Of 32 cases below the age of two years recently seen by him at the crèche at the Hôpital Necker, 6 were uncomplicated, and all recovered; 11 were complicated by bronchitis or slight pulmonary congestion, with 1 death; and 15 by bronchopneumonia, with 7 deaths. The infant does not possess any real immunity, but is merely less exposed to contagion from without, the infection being chiefly contracted from the mother.

According to H. Wilson,¹³ *hæmoptysis* in influenza begins towards the end of the illness, when there is slight cough, an increase in weight, and no great tendency to wasting. The sputum shows a bright-red staining, and not the rusty tint of pneumonia. Pneumococci are the predominant organisms, and not tubercle bacilli. The physical signs are characterized by their bilateral posterior distribution in the suprascapular areas, where breath sounds are faint and moist, granular adventitious sounds are abundant, with no bronchial breathing, and with some bilateral impairment of the percussion note.

Heart.—Sir J. Mackenzie¹⁴ has never seen any case of influenza in which damage was limited to the heart alone, as in rheumatic fever. Although pericarditis, endocarditis, and myocarditis occur along with lung complications, he has never known a patient recover with damaged valves. While admitting that influenza may lay the beginnings of a myocarditis which ultimately leads to heart failure, he has never met with such a case. He regards the weakness after influenza as not entirely cardiac in origin, but as the outcome of an injury to other systems as well as the heart, such as the central nervous system. Even such marked abnormalities as increased rate, systolic murmurs, an increase in size of the heart, or irregularity due to extrasystoles, should not be regarded as due to heart disease, but merely as a manifestation of general illness.

Kidneys.—According to the official report quoted by Knack,¹⁵ on the epidemic in the German Army in 1889-90, among 55,263 cases there were only 10 instances of serious renal disease, which did not differ in any respect from

that occurring after other infectious diseases. Subsequent experience has confirmed that of the 1889 epidemic, and recent text-books state that post-influenzal nephritis is uncommon. During the last epidemic Knack found a trace or cloud of albumin almost invariably present in mild and moderate cases of uncomplicated influenza. The albuminuria usually appeared during the first few days of the disease, and disappeared with or shortly after the fall of temperature, but in rare cases it persisted for several weeks. An outbreak of influenza in the department for war nephritis gave Knack an opportunity of studying the effect of influenza on pre-existing renal disease. In many cases the kidney did not show any reaction, while in others there was a more or less pronounced but transitory aggravation of the renal condition.

Abdomen.—M. Behrend¹⁶ has seen 8 cases of acute *appendicitis* complicating influenza, 6 of which were in adults and 2 in children. None gave a previous history of *appendicitis*. Three were operated on and were found to be suppurative cases; one recovered. Schmieden¹⁷ states that *appendicitis* was frequently seen in the Halle Surgical Clinic in the form of a mild subacute attack which did not end in suppuration or require laparotomy. A similar condition was occasionally found in the descending colon and sigmoid. Schmieden has often seen *cholecystitis* occur during an epidemic in persons who have never had any previous attacks, especially in children and young persons, in whom gall-stones were not likely to be responsible for the condition.

Nervous System.—W. Harris¹⁸ classifies the effects of influenza upon the nervous system in the following three groups: (1) The nervous symptoms of the onset, including headache, pains in the back and limbs, and neuralgic pains in the thoracic and abdominal viscera: (2) Complications arising during the illness, such as tachycardia, polio-encephalitis, meningitis, optic neuritis, retinitis, ophthalmoplegia, hysteroid convulsions, Landry's paralysis, herpes zoster, local and multiple neuritis, and neuralgia: (3) Sequelæ, such as loss of smell and taste, which may be permanent, progressive bulbar palsy, myasthenia gravis, epilepsy, migraine, loss of memory, and intense inertia of mind and body.

According to Sir G. Savage,¹⁹ influenza of all the infectious diseases is the most likely to be followed by *mental disorder*, which as a rule is of a favourable type. In nearly all cases it requires stimulating treatment, but it is not infrequently the starting-point of final dissolution. The most dangerous ages are early youth and critical periods such as the climacteric and the puerperal condition.

Muscles.—In upwards of 20 cases observed by Abrahams, Hallows, and French,²⁰ spontaneous rupture of one or both rectus abdominis muscles occurred, generally in their subumbilical portion. Coughing is apparently the immediate cause of the rupture, but the muscle has become diseased before it breaks. The lesion is related to Zenker's degeneration, but differs from it in that the muscle is hæmorrhagic and not pallid. H. Gage²¹ reports three cases of abscess in the sheath of the rectus abdominis, the condition being due to infection of the blood-clot in the ruptured muscle by the predominant organism.

Ear.—F. H. Hill²² reports that in 6870 cases of influenza there were only 120 cases of acute suppurative otitis media, or about 1.75 per cent. The greater proportion of the cases occurred in attacks complicated by pneumonia. The otitis was characterized by hyperæmia, followed by hyperplasia or hyperplastic œdema of the mucous membrane of the middle ear. There were 6 cases of acute frontal sinusitis and 3 of ethmoiditis in the series. No maxillary sinusitis was noted.

Throat.—Meyer²³ observed 15 cases of laryngeal stenosis, clinically resembling laryngeal diphtheria in the symptoms of dyspnoea, although no diphtheria

bacilli were found during life or post mortem. No deposit was seen on the tonsils, pillars, or posterior pharyngeal wall; but 6 of the eight cases which came to autopsy showed fibrinous deposit on the larynx, trachea, and bronchi; and of the other cases, 1 showed hæmorrhagic laryngotracheitis, and the other mucopurulent bronchitis and bronchiolitis. Tracheotomy was performed in 5 cases, all of which were fatal; intubation in 2, with successful results.

Eyes.—The ocular complications of influenza are discussed by Wessely,²⁴ who reports cases in children of streptococcal metastatic ophthalmia, severe plastic iritis, and embolism of the retina, as sequels of influenza. He has also seen a few instances of acute conjunctivitis, and herpes of the cornea, both of a mild and severe type, occasionally followed by deep ulceration and optic neuritis. Paralysis of accommodation is frequently attributed to influenza, but is probably always due to unrecognized diphtheria mistaken for influenza.

Skin.—In addition to rashes occurring during the acute stage (see MEDICAL ANNUAL, 1919, p. 205), the following skin manifestations have recently been described in connection with influenza: *alopecia* (Ayres,²⁵ Levin²⁶), Beau's lines on the nails (Merian²⁷), *striæ atrophicæ* (Cockayne²⁸), and *subcutaneous emphysema* (Conner,²⁹ La Fétra²⁰). The last condition is usually seen in cases of severe pneumonia, and appears first either in the episternal notch or above the clavicles, extending thence to the neck, face, scalp, chest, arms, and trunk. In most cases the air reaches the subcutaneous tissue by rupture of the air vesicles, and by passing thence along the vessel sheaths to the hilum of the lung and superior mediastinum.

Pregnancy.—Writing on influenza in relation to pregnancy and labour, Bland³¹ points out that a mild or moderate attack is not associated with grave danger to the mother or her gestation. On the other hand, when it is complicated by pneumonia, it is an extremely serious affection, and is associated with abortion or premature labour in a large percentage of cases, frequently followed by death of both mother and child. In a paper based on the statistics of 1350 cases of influenza in pregnancy, J. W. Harris³² states that pneumonia occurred in about half the cases. About 50 per cent of the cases complicated by pneumonia died, the mortality being somewhat greater in the last months of pregnancy. The gross mortality of all cases was 29 per cent. Pregnancy was interrupted in 26 per cent of the uncomplicated cases and in 52 per cent of those complicated by pneumonia. The mortality of influenza was considerably higher (41 per cent) in cases complicated by abortion or premature labour than in those in which pregnancy was uninterrupted (16 per cent).

DIAGNOSIS.—Sir T. Horder³³ draws attention to the likeness of severe influenza to typhoid fever, owing to the high temperature, marked nerve prostration, and leucopenia. Early poliomyelitis may also be mistaken for influenza, and it is not unlikely that some of the cases of 'neuritis' following influenza in children and adults are really cases of this disease.

As the malignancy of the recent epidemic suggested that the disease might possibly be pneumonic plague, De Brun³⁴ points out the following distinctions between the two diseases. Pneumonic plague is really a septicæmia, characterized clinically by the co-existence of variable bronchial and pulmonary lesions. As a rule, contrary to what might be expected, the lungs in pneumonic plague appear to be normal, or there is only a slight degree of bronchitis without any predilection for the bases. Bacteriologically the sputum is teeming with plague bacilli, either in pure culture or in association with a few streptococci. Lastly, unlike influenzal pneumonia, pneumonic plague is accompanied from the first by a remarkable degree of leucopenia.

A. D. Rood³⁵ regards x rays as invaluable in deciding questions of doubt as to

early diagnosis and presence of complications, including encapsulated empyemas, pleurisy, and pleural and pericardial effusions. Care, however, must be taken in estimating the amount of pleural fluid present, as hæmorrhagic lung shadows may blend with those of fluid. J. S. Diamond,³⁶ who has found radiology of considerable help in the diagnosis of influenzal pneumonia, states that it is practically the only method of discovering old lesions of the lungs, pleura, and even heart, which are overshadowed by the acute lesion. It should be realized, however, that unresolved pneumonias will give findings similar to pulmonary tuberculosis when the lesions are confined to the upper lobe.

PROGNOSIS.—Sir T. Horder³³ maintains that a high temperature is not a grave symptom during the first forty-eight hours, but only when the patient comes under treatment late. Next to fulminating cases, in which the prognosis is almost always fatal, the outlook is worst in those who develop progressively cyanosis, delirium, or stupor, diminishing cough, high and continued fever, and physical signs of extensive pulmonary congestion. Apart from the condition of the lungs, the following points are in the patient's favour: an age below 20 or above 40, an irregular pyrexia as contrasted with high continued fever, catarrh of the upper respiratory tract and air-passages, coarse as compared with fine râles on auscultation, mucopurulent rather than tenacious and bloody-mucous sputa, strict correspondence of the temperature curve with the pulse-rate, absence of cyanosis, and a moist skin. On the other hand, the following symptoms are unfavourable: delirium, stupor, insomnia, persistent vomiting, and repeated diarrhœa.

A. Abrahams, N. Hallows, and H. French²⁰ regard *heliotrope cyanosis* as a very grave sign, even if the patient seems comfortable, has no evidence of consolidation in either lung, is sleeping well, and taking nourishment, recovery after the appearance of this sign being most exceptional.

The unfavourable prognosis in cases of *malaria* complicated by influenza is shown by the fact that the mortality in such cases ranges from 75 to 84 per cent (Matko³⁷), the course of the disease being characterized by the rapid development of heart failure and intense dyspnœa.

(For the prognosis of influenza in pregnancy and labour, see p. 185.)

PROPHYLAXIS.—Leonard Hill³⁸ recommends the deep breathing of cool air brought about by exercise, sleeping in the open air, and, as an adjunct, any spray, gargle, or snuff which enhances the outflow of secretion from the respiratory membrane of the nose and throat. He deprecates the wearing of a mask which, by raising the temperature and humidity of the air breathed, interferes with the natural defensive mechanism.

As substitutes for the mask, the insertion into the nostrils of a cone-shaped pledget of gauze or of a plug of cotton-wool is recommended by J. C. Minor³⁹ and H. C. Lucey¹⁰ respectively.

A. Wylie⁴¹ has found a **Formalin Spray** useful in checking epidemics among troops and prison camps; 6 drachms of 40 per cent formaldehyde to 1½ pints of water were used in each spray, making approximately a solution and vapour of 1 per cent formalin.

TREATMENT.—Sir StClair Thomson⁴² condemns the use of sprays and lotions during the acute stage, as they are liable to disseminate the infection, and there is a risk of their carrying it to the ear. The routine use of a saline or alkaline nose lotion is unnecessary. Inhalations every two hours of **Menthol** (½ dr.) and **Tincture of Eucalyptus** (3 oz.), a teaspoonful of which is put into a pint of boiling water, generally relieve pain and frequently stimulate a free discharge. When the acute stage is past, a simple alkaline nose lotion may be employed. For the paroxysmal cough, **Bromide** or **Chloral Hydrate** is indicated (see *MEDICAL ANNUAL*, 1919, p. 209). **Sedative Sprays** of menthol,

heroin, codeine, or morphia should be tried. Warburton Begbie's mixture can be recommended :

R	Acid. Hydrocyan Dil.		Glycerini	℥ss
	Acid. Nitric. Dil.	āā	Inf. Quassia	℥vj

A teaspoonful in a wineglassful of water three times a day.

The use of large doses of **Salicin** (20 gr. every hour for twelve hours, followed by 20 gr. every two hours for the next twelve hours) is advocated by E. B. Turner,⁴³ who claims to have treated 2300 cases in this way since 1889 without a single death or complication.

W. D. D. Small and W. O. Blanchard⁴⁴ found that **Gelsemium** combined with **Belladonna**, as in the following prescription, tended to shorten the illness and rapidly relieved the headache and backache :—

R	Tinct. Gelsemii	℥xij	Syrup. Aurant.	℥j
	Tinct. Belladonnæ	℥v	Aq. Chlorof.	ad ℥j
	Pot. Cit.	gr. x		

1 oz. four-hourly for the first twenty-four hours ; thereafter $\frac{1}{2}$ oz. every four hours till the temperature is normal.

Blood Transfusion advocated by some observers (see pp. 4, 5), and intra-venous injections of **Mercuric Chloride** (p. 10).

Vaccine Treatment.—W. H. Wynn⁴⁵ believes that an attack of influenza can be aborted and bronchopneumonia prevented by prompt treatment with vaccine within a few hours of the onset. In early cases of bronchopneumonia the vaccine often seems to have the same good effect. The vaccine used by Wynn consisted of several strains of pneumococci, streptococci, and *B. influenzae*. In a few cases in which the pneumobacillus was present in the sputum, this organism was added. The dose recommended for an adult man is 80 to 100 million of each organism, for an adult woman 60 to 80 million, for a child of ten or twelve 30 to 50 million, and for a child of two or three 10 to 20 million. The importance of early vaccine treatment is shown by the fact that while 71·4 per cent of those injected on the first day had a normal temperature within twenty-four hours, on the second day the percentage was 47·8, on the third day 50, on the fourth day 30, and on the fifth day 35·7. Of the 10 deaths among Wynn's 107 cases, 7 were not inoculated till the fourth or fifth day.

R. Murray Leslie⁴⁶ has treated a considerable number of cases of simple influenza with two successive doses of 45 and 60 million of the total organisms of a mixed vaccine containing streptococcus, pneumococcus, and *B. influenzae*, with the following results : (1) A remarkable change in the character of the pyrexia occurs, the temperature falling to normal within from twelve to thirty-six hours ; (2) Improvement in the general condition results, with a reduction in the pulse- and respiration-rate ; (3) Resolution of pneumonic consolidation is usually rapid, and is hastened by a second inoculation ; (4) There is a comparative absence of toxic symptoms during the illness ; (5) The tendency to empyema and other grave sequelæ is lessened ; (6) Convalescence is usually rapid, and there is a comparative absence of cardiac debility, nervous exhaustion, and general prostration.

Foreign Protein injections advocated in influenzal pneumonia, also pneumococcal serum (see p. 11).

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137; ¹⁴*Pract.* 1919, i, 19; ¹⁵*Med. Supp. Rev. Foreign Press*, 1918, 445; ¹⁶*Surg. Gyn. and Obst.* 1919, ii, 601; ¹⁷*Munch. med. Woch.* 1919, 229; ¹⁸*Pract.* 1919, i, 89; ¹⁹*Ibid.* 36; ²⁰*Lancet*, 1919, i, 1; ²¹*Ann. Surg.* 1919, ii, 188; ²²*Laryngoscope*, 1919, 351; ²³*Deut. med. Woch.* 1919, 38; ²⁴*Munch. med. Woch.* 1919, 253; ²⁵*Boston Med. and Surg. Jour.* 1919, i, 464; ²⁶*N.Y. Med. Jour.* 1919, i, 409; ²⁷*Med. Science*, 1919, 145; ²⁸*Brit. Jour. Derm. and Syph.* 1919, 93; ²⁹*Jour. Amer. Med. Assoc.* 1919, ii, 321; ³⁰*Amer. Jour. Med. Sci.*, 1919, i, 770; ³¹*Amer. Jour. Obst.* 1919, i, 184; ³²*Jour. Amer. Med. Assoc.* 1919, i, 918; ³³*Lancet*, 1918, ii, 871; ³⁴*Med. Supp. Rev. Foreign Press*, 1919, 74; ³⁵*N.Y. Med. Jour.* 1919, i, 493; ³⁶*Ibid.* 584; ³⁷*Med. Supp. Rev. Foreign Press*, 1919, 166; ³⁸*Brit. Med. Jour.* 1919, i, 328; ³⁹*N.Y. Med. Jour.* 1918, ii, 895; ⁴⁰*Brit. Med. Jour.* 1919, i, 307; ⁴¹*Lancet*, 1919, i, 256; ⁴²*Pract.* 1919, i, 12; ⁴³*Brit. Med. Jour.* 1919, i, 278; ⁴⁴*Ibid.* 241; ⁴⁵*Pract.* 1919, i, 77, and *Ibid.* ii, 288; ⁴⁶*Med. Press*, 1919, i, 411, 431.

INSANITY. (See MENTAL DISEASES.)

INTESTINAL ENTOZOA.

Sir Leonard Rogers, M.D., F.R.S.

Helminthic.—C. A. Kofoid and A. W. White,¹ while examining the stools of troops in Texas, have repeatedly found an intestinal ovum of a very large size, averaging from 40 to 45 microns. As it is flattened on the face they provisionally class it as among the *Oxyuridæ*, but the parent worm has not yet been found. J. B. Cleland² describes the third recorded case of the occurrence in the human tissues of the *Sparganum*, or larval form of *Bothriocephalus mansoni*. It occurred in a small inflammatory swelling in front of the leg of a man in Sydney. Annie Porter³ has made an extensive investigation of intestinal entozoa in natives in Johannesburg, *Tænia saginata* and *solium* being common in addition to *Ankylostoma*.

Protozoal.—Annie Porter,³ in South Africa, in addition to entamœbæ, found *Gardia intestinalis*, *Trichomonas intestinalis*, and *Chilomastix mesneli* to be common, and capable of producing flagellate diarrhœa and to be difficult of elimination. *Isospora bigemina* was also pathogenic to cats and white rats. Illustrations of the different parasites are given. A. J. Hinkelmann,⁴ in a paper on protozoal parasites, describes the entry into the circulation and generalization of infection of *Balantidium coli*, *Cercomonas hominis*, and other parasitic flagellates. The kidney is especially liable to infection, with appearance of the parasites in the urine. They might be recovered from the blood in a living state after hæmolyzing it with distilled water and centrifuging. The *Balantidium coli* was cultivated from the blood mixed with two hundred times its volume of distilled water. Doris L. Mackinnon⁵ has studied intestinal protozoa found in 1680 stools examined by her in a war hospital at Southampton, six examinations having been made in the great majority of them, and found 51.4 per cent to be infected; entamœbæ were the commonest, while *Gardia intestinalis* (13.4 per cent) and *Chilomastix mesneli* (5 per cent) were next most frequently met with. F. Smithies⁶ has investigated the prevalence of intestinal protozoa in the middle west of the United States, where they were frequently the cause of intermittent diarrhœa, often of a very chronic nature, accompanied with dyspepsia and abdominal discomfort or pain. They are most readily found after a saline purge, with the aid of a warm stage made of a copper plate heated by a Bunsen micro-burner. *Cercomonas* and *Trichomonas intestinalis* were the most common. A variable degree of anæmia and eosinophil increase were frequent. They found the flagellate protozoa to be readily destroyed by 5- to 15-gr. doses of Calomel every evening, followed by 2 oz. of Epsom Salts the next morning, for five days, *Lambliæ* proving the most resistant. Jacques Carles⁷ also deals with chronic enteritis, and considers the flagellates a common cause; they yield best to Sulphur, Thymol, Turpentine, or Male Fern. M. Labbé⁸ deals with enteritis due to *Cercomonas intestinalis* or to *Lamblia*, which he considers an important pathogenic organism. It was

very resistant to treatment, none of the numerous remedies tried, including those advised by Carles, having proved effective.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, i, 567; ²*Med. Jour. of Australia*, 1918, Sept. 21, 239; ³*South African Inst. for Med. Research*, No. xi (abstr. in *Lancet*, 1919, i, 521); ⁴*N.Y. Med. Jour.* 1919, i, 235; ⁵*Lancet*, 1918, ii, 386; ⁶*Amer. Jour. Med. Sci.* 1918, ii, 173; ⁷*Presse Méd.* 1919, Feb. 10, 67; ⁸*Ibid.* March 27, 161.

INTESTINES, SURGERY OF. E. Wyllys Andrews, A.M., M.D., F.A.C.S.

Soresi¹ reports the results of a large amount of experimental work on end-to-end anastomosis. He proves that infection in the so-called mesenteric triangle is impossible to avoid. Radiographs of injected specimens show that there is a rich anastomosis in the bowel wall itself, but very little in this dead space. Potential infection is always present here, no matter what type of operation is done, or with what care. Cultures taken immediately after operation are invariably positive. The use of strong caustics or the thermocautery does not help. Pus always forms in this dead space, and the only reason that serious results are not more frequent is that it usually drains into the bowel. Larger amounts of pus were noted after the use of antiseptics or the cautery, which only further devitalize already weakened tissues. He concludes that lateral anastomosis is the method of choice, but says that, because of the weakened condition of the patient in certain cases, the end-to-end method is justified on account of the greater rapidity possible.

[The reviewer has observed a tendency of surgeons to return to the end-to-end method, due probably to two causes: (1) Under the stress of war conditions at the front, many end-to-end anastomoses were done, and quite rightly, on account of the speed necessary; (2) Experiments have shown that peristalsis at the junction of a lateral anastomosis is very slight, and that the blind ends are prone to dilate. In our opinion the latter is not an important factor; and we should adopt the more tedious but safer method whenever circumstances permit.—E. W. A.]

The problem as to whether the duodenum is necessary to life has finally been definitely settled. Moorhead and Landes,² and Grey³ have each succeeded in doing a complete duodenectomy in dogs, and the animals survived for long periods in perfect health. The technical difficulties are great, and the operations are done in three stages. The common bile-duct and the pancreatic duct, which are separate in the dog, are implanted in the jejunum, and a gastro-jejunosomy is done. The duodenum cannot be resected entire, because in the dog the pancreaticoduodenal artery which supplies the pancreas is embedded in the wall of the duodenum. However, the mucosa is shelled out, and the muscle wall left in this region. No glycosuria resulted, and the animals did not lose weight.

Gastromesenteric ileus, the so-called acute dilatation of the stomach, has been the object of much investigation. The location of the obstruction is at the duodenojejunal juncture, and the duodenum dilates as well as the stomach. Severe intoxication, collapse, and death in from twelve to thirty-six hours is the rule, unless the obstruction is relieved. The poison is a proteose, and, as shown by Eisberg and Draper,⁴ it is not derived from food digestion or from bacteria, but is secreted in the duodenum. They made a closed loop of duodenum, and death ensued rapidly with a similar intoxication. Isolated loops of ileum or jejunum in the dog cause little or no intoxication. Fisher⁵ divided these cases into three groups: (1) Organic ileus, due to tumour adhesions, internal herniæ, etc.; (2) Acute gastromesenteric ileus of neurogenic origin; (3) Chronic arteriomeseenteric ileus due to visceroptosis and traction on the root of the mesentery. He advises duodenojejunosomy. Ranzel⁶ thinks that mechanical factors are more important, and Condon⁷ substantiates this

view with brilliant results from a new method of treatment. In eight cases he injected large amounts of normal salt solution into the free peritoneal cavity. This is a simple procedure and not dangerous. A spinal puncture needle was used, and 2000 to 3500 c.c. can be borne without discomfort. The patient is then put in the Fowler position. The fluid gravitates into the pelvis; the intestines, containing gas, are floated up, and the tension on the root of the mesentery is relieved. The results in all eight cases were striking and prompt, and one is led to hope that this problem is solved.

REFERENCES.—¹*Ann. Surg.* 1919, June, 613; ²*Jour. Amer. Med. Assoc.* 1919, April 19, 1127; ³*Surg. Gyn. and Obst.* 1919, Jan., 36; ⁴*Jour. Amer. Med. Assoc.* 1918, Nov. 16, 1634; ⁵*Ann. Surg.* Dec., 582; ⁶*Deut. Zeit. f. Chir.* 1919, July, 361; ⁷*Ann. Surg.* 1919, July, 107.

ISCHIORECTAL ABSCESS; ANAL ABSCESS.

J. P. Lockhart-Mummery, F.R.C.S.

An ischiorectal abscess is nearly always the precursor of a fistula in ano. While this seems to be a well-recognized truth, the reason for it is not so well understood, nor the fact that it can frequently be prevented. The reason why an ischiorectal abscess so commonly results in a fistula is that it is not laid open in time to prevent this complication. The explanation is really an anatomical one. The deep fascia, which everywhere else lies just under the subcuticular fat, in the ischiorectal region is reflected deeply to line the walls of the fossæ, and the fat filling up the ischiorectal fossæ is thus superficial to the deep fascia. The skin of the buttock, also, is very tough, from the fact that it has to stand the friction and pressure of sitting for long periods. It results from this that when inflammation occurs in the ischiorectal region, the pus can spread easily without producing much pressure; consequently, two of the principal symptoms of abscess—namely, pain and swelling—are not produced until the abscess has already reached a considerable size. In other parts of the body an abscess very soon causes such obvious symptoms that it is opened with a knife, or it bursts through the skin before it reaches a large size. In the ischiorectal fossæ, however, a large cavity is produced before the abscess is relieved. The proper treatment is to plunge a knife into the inflamed part as soon as induration and tenderness are detected. This, by giving an exit to the products of inflammation and relieving the pressure, will stop any increase in the size of the abscess, and almost certainly obviate a fistula. Too often the patient is treated by baths and fomentations until the abscess bursts, or until a swelling has made it too late to prevent a fistula. When a large abscess has formed and has to be opened, a crucial incision into the ischiorectal fossa should be made, and the triangular flaps cut away with scissors. This will leave a large, roughly circular opening. No attempt should be made to wash out the cavity, and on no account must it be packed with gauze. The pus is allowed to drain slowly away, with a large antiseptic pad which should be changed every two or three hours, and the patient should sit in a hot bath two or three times a day for half an hour or more. No attempt must be made to operate upon the fistula until the cavity has closed down as far as it will. This will take a fortnight to three weeks.

JAUNDICE, INFECTIVE.

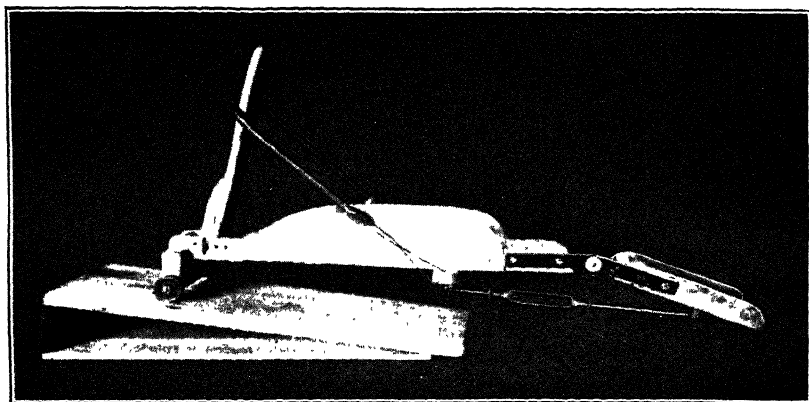
J. D. Rolleston, M.D.

Costa and Troisier¹ describe three cases of the psychomeningeal form of spirochætositis icterohæmorrhagica, the chief mental symptoms of which were oneritic delirium and confusion, the latter disappearing after recovery from the jaundice. The permanent mental disorders left by spirochætositis icterohæmorrhagica are mental deficiency with instability and irritability. The cases with these symptoms had severe attacks with azotæmia (4.7 grm. urea in the cerebrospinal

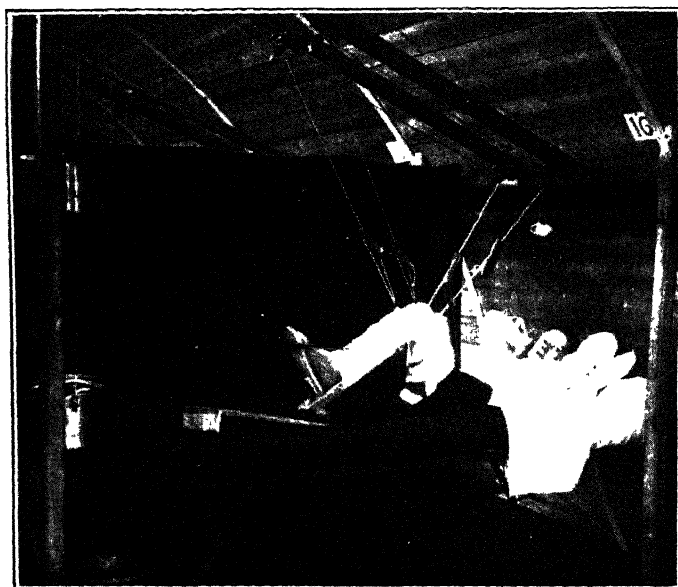
PLATE XX.

SUPPURATIVE ARTHRITIS OF KNEE-JOINT

(MAJOR J. EVERIDGE.)



'Active movement' splint. It can be made 'rigid' by fixation of the adjuster below the knee. Note the adjustable foot-piece, supported by elastic slings; and the travelling wheels under foot-piece.



Demonstrating the apparatus in use.

By kind permission of the 'British Journal of Surgery'

fluid), cardiac dilatation, asthenia, high temperature, anæmia, deep icterus, and a pronounced meningeal reaction (480 cells per c.mm.). In the course of the disease, and after recovery, one of the patients showed a positive Babinski's sign, which indicated an obstinate lesion of the pyramidal tracts.

Denechau,² who records an illustrative case, draws attention to the liability of spirochætosis icterohæmorrhagica to be mistaken for influenza, especially during an epidemic of that disease. In both disorders there is an acute onset with nervous and intestinal symptoms; and influenza, especially when complicated by pneumonia, may be accompanied by icterus.

REFERENCES.—¹*Med. Supp. Rev. Foreign Press*, 1919, 173; ²*Ibid.*

JOINTS, SURGERY OF. (See also TUBERCULOSIS, SURGICAL.)

Sir W. I. de Courcy Wheeler, F.R.C.S.I.

Sacquépée and Voillon¹ are agreed that the number of germs visible in a joint effusion after infection is less than in the neighbouring muscles or bones. No organisms can, as a rule, be found in a smear taken twenty-four hours after infection. They regard synovial fluid as a powerful germicide, provided it is freshly secreted. Like all antiseptics it must constantly be renewed and drained off when its power is exhausted. [The germicidal power of synovial fluid is open to doubt, and the investigations of J. B. Murphy rather go to prove the contrary.—W. I. de C. W.]

Suppurative Arthritis.—Willems² finds that ordinary measures of drainage and lavage are incapable of preventing pus-retention in a joint: he therefore advocates uni- or bi-lateral arthrotomy, followed by *immediate* movements, which must not be passive but active. No drains are used; no lavage is made. The active movements express the pus from the joint. A free exit is thus essential, and the arthrotomy wounds must be kept open *in their whole length*. True pain appears only when drainage is insufficient.

'Active Movement' *Splint*.—In lesions of the knee, Willems notes that some patients exhaust themselves in vain endeavours to raise the leg from the bed, and J. Everidge,³ to facilitate and encourage the joint movements, which must be as continuous as possible, uses a splint which counterpoises the lower limb to avoid the useless effort of lifting that must precede flexion of the knee (*Plate XX*). He also fixes wheels to the foot-piece, which can thus roll easily on an inclined plane. A detachable adjuster connects the leg- and thigh-pieces, and leaves the knee movable or fixed, as required. Everidge found that when mobilization was not begun until after the seventieth day, ankylosis occurred, and Cotte, while agreeing that immediate mobilization gives good results in early cases, finds it useless in the later stages of arthritis.

Internal Derangements of the Knee-joint.—T. Hammond's investigation⁴ of 283 cases admitted to Alder Hey Military Orthopædic Hospital has an interest for civil practitioners, especially in regard to the assessment of pensions. He finds that each recurrence of derangement is followed by less pain and less tendency to effusion. In the intervals the patient may complain of weakness and instability of the knee, especially marked when walking on rough ground. There is usually tenderness over the edge of the cartilage, and wasting of the quadriceps. At the time of cartilage luxation physical signs are well marked, but the intervening stage is often conspicuous by their absence.

Simulation of internal derangements of the knee is by no means uncommon, and such cases are often exceedingly difficult to diagnose. In all doubtful cases at Alder Hey the soldier was put through a full gymnastic course each day, following which an examination for limited movement, effusion, etc., was made. Under no consideration was an operation performed until something more than the soldier's statement was present to warrant the diagnosis. After operation

the wasting of the quadriceps may persist from deliberate disuse, a fact to be remembered in assessing this disability.

Fractures of the Patellar Border.—R. Salmond⁵ draws attention to the importance of recognizing these fractures, which are due to slight indirect trauma. Often no history of injury can be obtained. The condition may be bilateral, the patient complaining of weakness or discomfort in the knee-joint. The seat of any discomfort or pain is usually on the *inner* side of the patella, while the fissure fractures observed have been without exception on the outer border.

Synovitis is frequently present, or has been at some previous date, caused partly by the tearing

of the synovial membrane with the fissuring of the posterior surface of the patella, and it is prone to recur. The direction of the line of fracture is either longitudinal or obliquely downwards and outwards—not transverse as in the usual muscular fracture—and a linear depression may be felt, corresponding to the line of fissure; pressure of the bone on either side of this may elicit separate movement, and generally tenderness, but not crepitus.

As regards radiography, the technique employed is to take an anterior view of the joint, and stereoscopic external laterals. The laterals should always be made, as they will often show the fissures to be multiple; as many as five distinct fragments have been seen. A posterior view of the joint is of little or no value, on

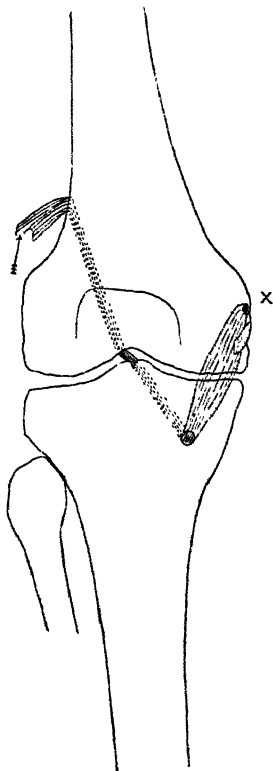


Fig. 24.—Reconstruction of crucial ligament. Diagram to illustrate course of new anterior crucial ligament.

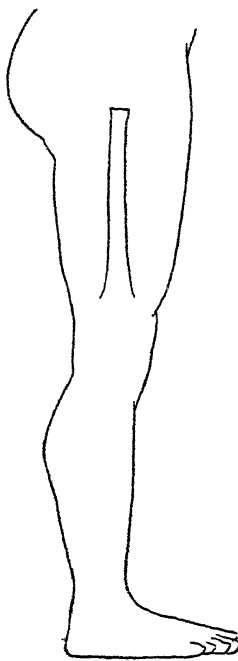


Fig. 25.—Reconstruction of crucial ligament. Diagram to show location and size of fascial strip.

account of the distortion of the patella. Screening alone for the determination of the condition is, of course, quite useless. There seems to be only one condition that might be mistaken for the one described, and that is when the shadow of a sesamoid bone in the outer head of the gastrocnemius muscle just overlaps the edge of the patellar shadow in the anterior view. The lateral plates will help to exclude error from this source. In cases diagnosed at the time of injury, prognosis is good. Treatment is by immobilization for two days in case of hæmorrhage; then passive movement should commence. Untreated cases are liable to develop fibrous union, leading to permanent weakness of the joint.

Alwyn Smith⁶ considers that examination of a knee-joint which presents a *damaged internal semilunar cartilage* is not complete without verifying the integrity of the anterior crucial ligament. Rotation outwards is always more obvious after removal of the internal semilunar cartilage, as is also abduction in the semiflexed position. The commonest form of knee sprain combines abduction of the knee with external rotation of the tibia, the knee being in the semiflexed position. The deep fibres of the internal lateral ligament attached to the internal semilunar cartilage become torn, and the cartilage either fractures or is displaced. Should the abduction of the knee continue further, the entire strain is borne by the anterior crucial ligament, which becomes in its turn stretched or torn, or the internal tubercle of the tibial spine is avulsed.

Diagnosis is made in old-standing knee-joint injuries by the combined symptoms, (1) locking of the joint, (2) rocking or slipping of the joint, combined with a feeling of insecurity. The removal of the cartilage cures the locking, but will, if anything, increase the rocking and slipping of the tibia on the femur. Internal and external rotation also are increased, especially the latter.

He finds a modification of Hey Groves's operation for reconstructing the anterior crucial ligament with a strip of fascia lata, the best. He makes the same fascial strip reinforce the internal lateral ligament, and so help to prevent abduction as well as sliding and rotation.

The patella is split: a bony tunnel is bored through femur and tibia (*Fig. 24*, dotted lines); the pedicled iliotibial strip (*Fig. 25*) is drawn through the tunnel and replaces the anterior crucial ligament. The free end of the strip passes finally at X (*Fig. 24*) antero-posteriorly through a tunnel bored in the internal condyle of the femur at the level of the abductor tubercle, and is fixed with chromic gut. This last tunnel is made most easily with a *curved* shoemaker's awl. The joint is immobilized and flexed to 20 degrees for four weeks: the quadriceps is then massaged and faradized, and gentle active movement is begun.

Internal Lateral Ligament.—T. P. McMurray⁷ finds that after the usual operation of shortening or pleating a ruptured or lax internal ligament of the knee-joint, due to lateral stress or torsion, abduction of the leg on the fully extended thigh generally recurs. He has treated ten cases by splitting vertically the part of the internal lateral ligament (relaxed by flexion of the knee to 40°) which overlies the femur, grooving the femur and suturing the sartorius tendon into the groove (*Figs. 26, 27*). Success depends on maintaining flexion throughout the operation, and the knee should be fixed in this position for three months. With an intact quadriceps the movements of the knee are unimpaired by this procedure.

Loose Bodies in Knee.—Henderson⁸ finds that next to the internal semilunar cartilage, loose bodies are the most frequent cause of derangement in the knee-joint. Foreign bodies, as a bullet or needle, are infrequent in private practice, but osteocartilaginous bodies are often found. They may be produced by: (1) Direct trauma knocking off a piece of the articular surface of the internal or external condyle of the femur or patella; (2) Osteochondritis desiccans; (3) Osteochondromatosis; (4) Hypertrophic arthritis.

Koenig first described the condition of *osteochondritis desiccans*, and advanced the theory that the end-artery supplying this area became plugged and the part became under-nourished and sloughed off. The slightest trauma, such as a quick turn, may produce the first symptoms. The number of loose bodies formed in this way rarely numbers more than two or three, and careful inspection of the radiograph will disclose the source as a flattened area on the internal condyle.

In *osteochondromatosis* there is an associated synovitis; the lining is inflamed, somewhat thickened, and pedunculated into teats. Some are fibrous, and others cartilaginous, becoming bulbous. They drop off and wander about in the synovial sac, are nourished by the joint fluid, and increase in size. There are factors which suggest these to be of the order of a new growth. In one of the author's cases there was a chondromatosis formation in the lower end of the femur, which later became malignant; the patient died with metastases in the lungs. In older people marginal osteophytic growths in marked cases of hypertrophic arthritis may break off and wander about the joint. In younger people with loose bodies there may develop a hypertrophic arthritis as a secondary condition.

At operation for loose bodies, Henderson recommends thrusting a sharp cutting needle through the skin, directly into the body, thus fixing it securely before it is cut down upon.

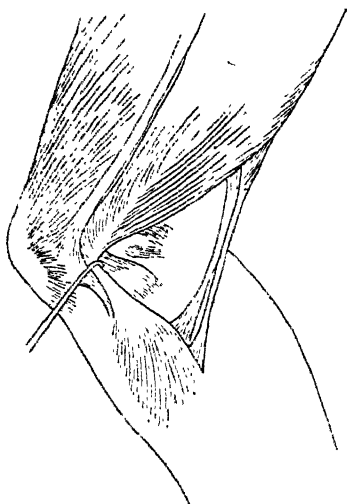


Fig. 26.—Sartorius tendon freed from fascia and brought forward over the internal lateral ligament.

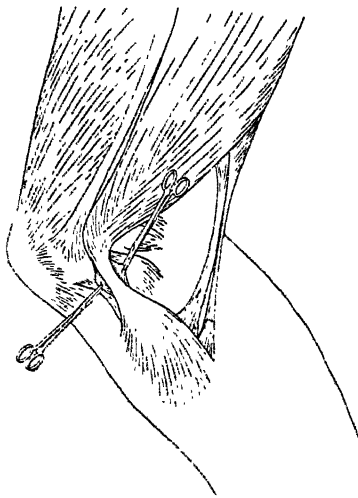
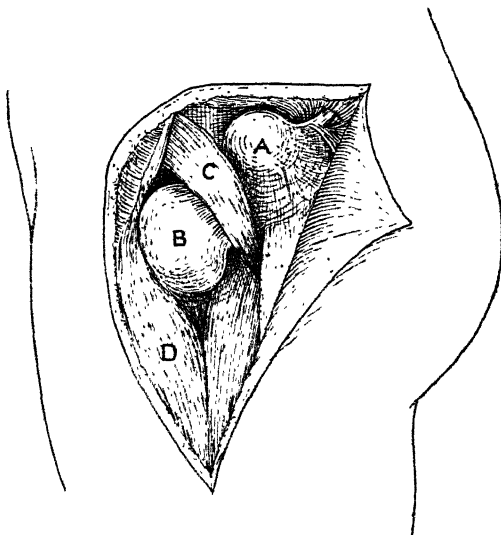


Fig. 27.—Sartorius tendon placed in position in groove in femur between the split upper end of internal lateral ligament.

Congenital Luxation of Hip.—A. M. Tubby⁹ finds that the iliopsoas tendon is the chief cause of difficulty in reducing luxations in older children. The tendon, instead of passing as it normally does across the femoral head, crosses the empty part of the capsule (Fig. 28) and makes the capsule like an hour-glass. A perforated diaphragm is formed at the constriction, which in time becomes rigid, and as age advances, the femoral head cannot, as in younger children, be forced through the perforation into the acetabulum. Tubby makes an incision 10 cm. long from the anterior inferior iliac spine downwards and inwards. The sartorius and tensor vaginae femoris are separated from each other, and, in order to give more room, the latter muscle is divided. It is quite simple then to expose the thickened hour-glass capsule. This is opened by a crucial incision over the head of the femur, external to the constriction. By everting the head of the femur, the narrow buttonhole-like entrance into the acetabulum can be felt, and the tight iliopsoas tendon defined. A hernia

knife is used as a tenotome, the constriction of the capsule and the iliopsoas tendon are freely divided, and with a little traction on the limb the caput

Fig. 28.—To illustrate the open operation for reduction of refractory cases of congenital dislocation of the hip. A, The dislocated and anteverted head of the femur, covered by the outer part of the capsule. B, The inner portion of the capsule, adjacent to the acetabulum. Between A and B the capsule has become constricted by the iliopsoas tendon, which has become a suspensory ligament of the body weight. C, The iliopsoas tendon. D The rectus femoris muscle. (After a drawing made by Mr. E. Rock Carling, at the time of operation.)



femoris slips easily into its socket (*Fig. 29*). The crucial incision into the capsule is then sewn up, and the limb put in plaster in the fully-abducted position.

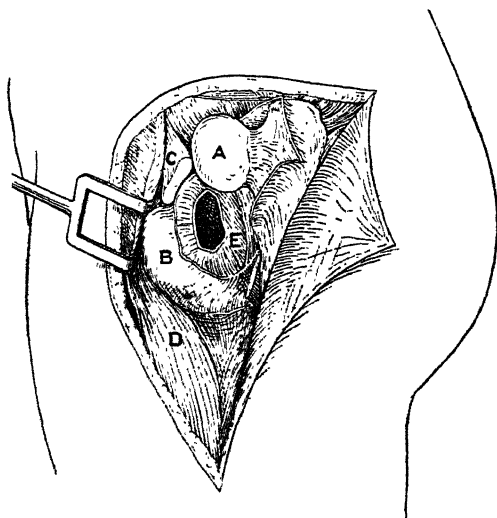


Fig. 29.—A stage, further than in *Fig. 28*, of the open operation. The capsule has been opened, the anteverted head of the femur exposed, and the iliopsoas tendon divided. A, The anteverted head of the femur. B, The inner portion of the capsule. C, The cut iliopsoas tendon. D, The rectus femoris muscle. E, The button-hole aperture in the diaphragm, forming the outer wall of the inner part of the capsule. (After a drawing by Mr. E. Rock Carling.)

In every case, manipulation and extension are first to be tried. If they fail, the adductors are cut; if, after this, reposition is impossible, Tubby's operation is indicated. He has had a success in a girl 15 years old.

'*Osteochondritis Deformans Juvenilis*' (*Perthes' disease, Legg's disease.*)—Ely¹⁰ claims a three years' priority for Legg in describing this condition, which is an error in development of the whole upper epiphysis of the femur—trochanter, neck, and head. In this the acetabulum sometimes shares. It affects chiefly the head and the proximal lateral portion of the neck, and the cartilage between them. The great trochanter may or may not be involved. The synovial



Fig. 30.—Case of Perthes' disease. April, 1916. Flattening and slight irregularity of the head, with some widening and irregularity of ossification of proximal part of the neck of the femur, in a sort of band near the epiphyseal line.



Fig. 31.—Same case December, 1917. Marked segmentation of head, with obliteration of any formal epiphyseal line. Irregular ossification of neck in the vicinity. Thickening of neck.

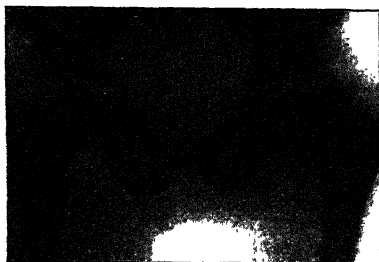


Fig. 32.—Same case November, 1918. Wider separation of head fragments. Increase of width of neck. Slight decrease in irregularity of ossification of neck. With this striking picture the hip is practically well.

membrane shows no sign of inflammation; therefore Perthes rightly concluded that the disease was not an arthritis. Neither the bone nor the cartilage shows evidence of inflammation, yet Perthes called the disease *osteochondritis deformans juvenilis*. It is first observed between the ages of five and ten.

The typical Röntgen picture consists in: (1) A flattening, broadening, and sometimes an apparent displacement of the epiphysis laterally, with one or more divisions of it, and irregularity of ossification; (2) An irregularity or even segment-

ation of the cartilage between it and the neck; (3) Loss of bony structure in the neck, especially of its proximal and lateral part; (4) Irregularity in contour of the upper part of the femur neck; (5) Distortion of the head; (6) Enlargement of the trochanter (occasionally); (7) Irregularity of the acetabulum (occasionally). (See Figs. 30-32).

The astounding difference between the marked changes in the x-ray picture and the comparative insignificance of the symptoms and physical signs is characteristic. The later picture shows a short thick neck, often coxa vara, and a distorted head. It is often seen after reduction of congenital hip dislocation, occasionally on the sound side. It is frequently bilateral, with symptoms

only on one side. Trauma probably does not cause it, but simply acts by spraining the distorted joint, causing the symptoms but not the disease.

The chief symptoms, when present, are limp and pain. Examination shows the limp, a prominent trochanter, and limitation, especially of abduction. Other motions may or may not be limited. A peculiar sign is the abduction at the hip when flexion is forced.

The affection seems to run its course in two or three years. Its most active period is one year. Even after all symptoms have subsided and a cure evidently has been obtained, the *x* ray may show an alarming picture.

Fibrous or bony union of the joint never occurs. The restriction of motion is mechanical. Legg's disease has often been mistaken for tuberculosis, but the diagnosis as a rule is not difficult. Tuberculosis has more pain, more muscular spasm, greater restriction of motion, and greater muscular atrophy. It shows radiographically more involvement on the shaft side of the epiphyseal line and less in the head of the bone. It has not the same disproportion between the *x*-ray picture and the symptoms and physical signs. As infection cannot be ruled out, any possible focus of infection in the body may be removed. Local treatment consists in reduction of the deformity, if necessary under anæsthetic, and the immobilization of the fully-abducted hip in a short plaster spica until the process has run its course and the neck has solidified.

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KALA-AZAR.

Sir Leonard Rogers, M.D., F.R.S.

PREVALENCE.—T. C. McCombie Young¹ reports on a further kala-azar survey in Assam during 1917-18. A survey made in 1914 had shown the limits of the infected area to be identical with those described by Rogers in 1897. The recent survey showed the disease to be absent from the Naga Hills, but revealed an important new focus in the Sibsagar District, further east than it had previously been found. One tea-garden was severely affected, but is being dealt with by the measures which proved uniformly successful for over twenty years in the Nowgong district, while both moving the villages and the modern treatment by antimony salts intravenously are being carried out in the new focus of the disease; the results are already encouraging, so the further disastrous spread of this terrible disease may yet be checked. Frias² reports finding eight young children infected with kala-azar in Spain, and states his opinion that under proper treatment the disease is not so grave as hitherto assumed. E. M. Johnstone³ studied the blood changes after splenectomy in two cases of kala-azar at Peking. He found, during a few days after the operation, numerous large horseshoe nucleated cells, which he regards as an advanced stage of myelocytes, and which disappeared in seven days, when mononuclears predominated.

TREATMENT.—L. Rogers⁴ records a trial of Colloid Antimony Sulphide intravenously in kala-azar, the new preparation having been made for him by F. L. Usher. It is best used as a 1-500 pink solution, made isotonic with 5 per cent glucose, and $\frac{1}{2}$ per cent carbolic acid is added as a preservative. Tests on animals showed it to be very much less toxic than sodium or potassium antimonyl tartrate, a rabbit standing nearly the dose required for a man. Ten cases treated with this preparation were all cured, and, on comparing the results with those obtained by the same observer with the two antimony tartrate salts, the duration of the fever was much shorter, and the gain in weight was twice as great under the colloidal preparation, while toxic symptoms were nearly

absent, so that the new drug appears to have great advantages over the formerly-used very toxic salts of antimony. The method of preparation is given, and a trial in sleeping sickness is advised. The oral administration of **Antimony Oxide** with food is advised, as it is soluble in weak hydrochloric acid, in addition to inunctions of 5 per cent finely divided **Antimony Ointment**, in young children suffering from kala-azar when their veins do not admit of frequently repeated intravenous injections. M. Johnstone⁵ records a case in China in which he removed the spleen, with recovery of the patient. A careful report on the blood changes before and after the operation is recorded, and shows an increase of a temporary nature, from 5000 before up to 11,000 to 32,000 within a few days after the operation, while two months later there was still a slight degree of leucocytosis, accompanied by a temporary increase of the polynuclears. R. Pastore⁶ reports continued good results in infantile kala-azar at Palermo with **Tartar Emetic** intravenously in children, beginning with 1 cgrm. into the jugular vein, and only increasing very gradually up to 5 or 10 cgrms. after the blood has begun to improve. He has had mediocre results only with antimony in baths and inunctions. B. B. Shaha⁷ reports 9 cases in young children from three months to three years old treated by Rogers's method of inunction of 5 per cent metallic antimony in lanolin, with 1 death within a week, in a very advanced case, and 8 cures.

S. S. Kundu⁸ reports on cases of kala-azar under J. Dodds Price treated in the Nowgong Dispensary, Assam, since 1917, by **Intravenous Injections of Tartar Emetic**. Patients now come readily for the treatment both as in- and out-patients, 150 outdoor and 100 indoor cases having been treated; but only 50 of the former came regularly enough to benefit materially, 48 being recorded as cured and 2 as relieved. Of 100 indoor cases, 47 were cured, 20 relieved, 18 discharged otherwise, and 15 died, only the more advanced cases having been admitted. As the mortality in this district used to be 96 per cent, these results demonstrate the great benefit of the new treatment. Sixty spleen punctures were performed without trouble. Leucopenia was characteristic in uncomplicated cases, but no parasites were found in the peripheral blood. A freshly prepared and boiled 1 per cent solution was used, and gradually increased to 10 c.c., and the patients were generally discharged cured after at least twenty injections within two and a half months. No case was seen in an infant in arms. Even cases with general anasarca may do well. Martinez,⁹ as a result of much experience of kala-azar in children and Oriental sore in adults, considers the efficacy of tartar emetic treatment is established beyond all doubt. The usual dose is 3 cgrm. in 1 c.c. distilled water. In children recovery is generally complete in a month.

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KIDNEY DISEASES. (See NEPHRITIS; URINE, ABNORMAL CONSTITUENTS OF.)

KIDNEY, FUNCTIONAL EFFICIENCY TESTS.

John D. Comrie, M.D., F.R.C.P.

The measurement of the renal function by the elimination of fluid, sodium chloride, and nitrogen, and by the specific gravity of the urine, was investigated in a large number of cases by Mosenthal.¹ He regards as the normal standard a maximum specific gravity of 1018 or higher, with a variation of 9 degrees or more between the maximum and minimum, a night urine (i.e., 8 p.m. to 8 a.m.) of 750 c.c. or less with a concentration of nitrogen amounting

at least to 1 per cent. Comparative tests were carried out both on fairly high and on low protein diets, in a series of patients suffering from various diseases that are known to impair renal function, and nocturnal polyuria was found to be more frequent on a high than on a low diet; when it occurred with a low protein diet, it was regarded as a grave sign of renal insufficiency. Working on the same lines, Mason² considers that it is necessary to determine the kidney function by a combined series of tests rather than by any single one; he found that, along with the observation of the effects of various diets, the preferable tests were the calculation of the rate of excretion of urea and of chlorides, and the phenolsulphonephthalein test.

The compatibility of prolonged life with low renal function is demonstrated by O'Hare³ in two cases: one lived for over three years with a phenolsulphonephthalein index of 12 and blood-urea nitrogen 59 mgrms. per 100 c.c.; the other lived for over five years with phenolsulphonephthalein index of 17 to 13 and blood-urea nitrogen of 50 mgrms. per 100 c.c. Both cases were found to have advanced arteriosclerotic changes in the kidneys.

The variability in nephritic patients of reaction to ingestion of large quantities of water is noted by Siebeck.⁴ He found that in patients with severe acute nephritis complicated by oedema, the administration of large draughts of water produced not the slightest sign of diuresis, while, at the same time, the number of red blood-corpuscles remained unaltered; this showed that the water was not retained in the blood, but escaped into the tissues. The excretion of water, therefore, depends not on the condition of the kidneys but on the tendency of the organism generally to excretion or retention.

Blood-pressure and kidney-function findings in orthostatic albuminuria have been investigated by Mason and Erickson.⁵ There was no evidence of any inability to concentrate sodium chloride or nitrogen either by day or by night, but the rate of excretion of urea was increased in most cases after prolonged standing; while the phenolsulphonephthalein test, always over 70, was higher in half of the cases standing, in the other half when the recumbent position was assumed. The symptoms so commonly presented of headache, lassitude, constipation, loss of weight, etc., these authors therefore attribute purely to the physical effects of visceroptosis, not at all to kidney inefficiency; the albuminuria was always found to be inversely proportional to the pulse-pressure for the time being.

The reaction of the urine as a test for renal efficiency is proposed by Leathes.⁶ The normal patient secretes during the night an acid urine which in the morning swings over to an alkaline reaction that persists generally till noon. For the application of this test, the patients were kept in bed, and received at 8 a.m. 500 c.c. of water but no other food or drink from supper of the preceding night till noon. All the patients with normal kidney function showed a diuresis with alkaline urine throughout the forenoon, while some of the nephritics reacted similarly, but most showed no immediate diuresis and continued to excrete acid urine.

The value of blood-urea concentration as a measure of renal function has been investigated by Kast and Wardell,⁷ who conclude that 20 mgrms. per 100 c.c. may be taken as the upper normal limit of urea nitrogen in the blood of hospital patients, and that for diagnostic purposes the estimation of the blood urea is a satisfactory index of the functional power of the kidney. The prognostic value of the creatinine of the blood in 100 cases of nephritis showing creatinine retention is recorded by Myers and Killian.⁸ Of these cases, 85 had over 5 mgrms. creatinine per 100 c.c. of blood (some as high as 33.8 mgrms.), and of these 80 have died; 3 are essentially unchanged; while 2 in whom the retention of creatinine was only temporary have recovered. A

considerable number of the 85 cases were able to go about, and the blood-urea and phthalein tests which were made simultaneously did not in all cases indicate a bad prognosis; the writers therefore conclude that in advanced cases of nephritis the blood-creatinine furnishes a more reliable prognosis than any other test we possess. Baumann, Hansmann, Davis, and Stevens⁹ have made a comparative study of the uric-acid content of the blood as an index of renal function, and regard it as very delicate; but they point out that the results may be unreliable in the presence of oedema, cardiac decompensation, or even when the urine is highly concentrated in hot weather. Maclean and Wesselow¹⁰ consider that in early nephritis the blood-urea content furnishes the best indication of the state of the kidneys, and that the phthalein test is of much value. They also consider the diastatic test to be of great value in conjunction with urea estimation, and give details for its performance. Fearon¹¹ also gives details for carrying out the estimation of the amylolytic properties of the urine and the significance of variations in health and disease.

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Oskar C. Gruner, M.D.

Methods Available.—These are of two kinds: (1) Directed towards detecting if the excretion is defective; (2) Directed towards ascertaining if there is undue retention in the blood. That is, we study either the urine or the blood. The chemical investigation of the blood has become more customary since larger quantities were demanded for serum tests than had previously been considered permissible.

The routine chemical analysis of the blood has been executed with varying degrees of thoroughness. Gettler and St. George¹ investigated the non-protein-N, the urea-N, the creatinine, the uric acid, the sugar, and the alkali reserve in every sample. Many other workers confine themselves to one or perhaps two analyses, such as the estimation of the urea content, of McLean's index, of the Ambard coefficient, and of the 'sodium chloride threshold'. Mason² reports on a comparative study of these factors. Leopold and Bernhard³ confine themselves to the non-protein-N and the uric-acid-N. Quinby,⁴ Goldstein,⁵ Merklen and Kudelski,⁶ Kast and Wardell,⁷ Widal, Weill, and Vallery-Radot⁸ note the urea-N. Hurwitz⁹ also studies the salts. Keith and Thomson¹⁰ note both the urea and the chloride content, and Ambard's coefficient. Pirondini¹¹ notes the urea and Ambard's coefficient. Bergouignan¹² combines a study of urea-N and salts with the estimation of the blood-pressure. Myers and Killian,¹³ who studied only the creatinine, were seeking special information. Haas¹⁴ uses the amount of indican in the blood as an index of renal efficiency. Labbé and Daughin¹⁵ ascertain the ratio between colloidal N and total N, though rather for the purpose of testing the vital function of the liver (see LIVER, FUNCTIONAL EFFICIENCY TESTS).

Purpose of the Tests.—(1) To obtain insight into the existence of any renal disturbance at all; (2) To determine the extent of impairment, for (a) diagnostic or (b) prognostic purposes; (3) To assess the danger to life from some other disease whose recovery depends on a sound kidney; (4) As a guide to a suitable diet;¹² (5) As a preliminary to undertaking operation—requiring seven to ten days' observation.

Degree of Reliability.—This is known when the fallacies to be encountered are understood. Rubow¹⁶ has argued that the residual N in the blood is not a proper index of the retention of N, because some of it is anchored in the tissues,

notably the liver. That is to say, if 20 grm. urea are administered, the amount in the blood after twenty-four hours depends on the state of certain other organs. Even sodium chloride may be retained by the tissues, so that the chloride 'threshold' does not bear the significance that is being attached to it. The answer to these criticisms is furnished by McLean and Wesselow,¹⁷ who approach the problem from a rather different standpoint. Here, as in all clinical pathological methods, it is necessary to begin by recognizing that the truths utilized are not absolute, but relative, in their accuracy. These writers therefore call to mind that the amount of albumin in the urine is not *per se* related to the kidney state. In 2 per cent of apparently fit men the albumin reached a decided amount owing to vesical conditions. It is present in trace in 5 per cent of apparently fit men. On the other hand, the most serious cases of nephritis may show only a trace of albumin.⁵ Then there is the golden rule of putting trust, not in one single test, but in whatever other biochemical test may be feasible. Hence the authors in question note the diastase content of the urine. The lower the value, the more serious the prognosis. The blood-pressure is also to be taken. Bergouignan¹² has drawn particular attention to the great danger lurking in the cardiovascular system in cases of nephritis.

The work of Gettler and St. George¹ goes to show the advantage of making several chemical determinations in the same sample. And it is evident that even if a case be straightforwardly glycaemic, the knowledge of the nitrogen excretion is as helpful in assessing the findings as it is in cases where the renal function is the prime consideration. The following table of results will be of interest for reference:—

	Normal	Nephritis	Cardiac failure	Gout
No. of cases studied	(Not stated)	600	350	120
Nonprotein-N per cent	25-40	40-460	35-220	30-55
Urea-N	10-18	20-375	18-180	15-35
Creatinine	0.1-0.8	2-42	1.5-12	1-2.8
Uric Acid	0.5-3	3-17	2.5-7	1.5-8.5
Sugar	60-110	75-160	70-135	85-140
Alkali Reserve	53-80	40-75	48-75	50-80

The values are in milligrams per 100 c.c. The figures are based, in all, on 15,000 determinations.

The chief outcome, in the present connection, is that if the non-protein N is over 80 the kidney is diseased. Similar results were obtained in a series of children studied by Leopold and Bernhard.³

Blood-urea.—All observers agree that more than 1 per mille means a grave prognosis, while less than 0.75 is a good sign. A rising quantity is a bad sign.⁶ The method now officially recommended is Van Slyke and Cullen's,¹⁸ where urease is used to convert the urea into ammonium carbonate, and the ammonia is then liberated by alkali and is aspirated into a measured amount of standard acid, or else measured by Nesslerization.

The Phenolsulphonephthalein Test is not advocated by McLean and Wesselow,¹⁷ because it fails to differentiate between the different types of nephritis. It is only of use for deciding whether the kidney function is impaired at all. Where 40 to 50 per cent of the dye is excreted in an hour, the kidney may be taken as being reasonably sound. Quinby and Mosenthal¹⁹ use it more freely, and Keith and Thomson¹⁰ use it for early cases of nephritis.

Analysis of the Urine Alone.—Pirondini¹¹ gives 10 grms. urea in 300 c.c. water and collects the urine every half-hour, and in each sample notes the volume

of urea and therefore the absolute urea output. The results run parallel to Ambard's coefficient and the phenolsulphonephthalein test, and may therefore safely supplant them.

Indican Threshold.—Haas¹⁴ has devised a simple method of ascertaining when the threshold is high, which means severe renal involvement. It should be 0.045 mgrm. per 100 c.c.

Creatinine Threshold.—The presence of more than 5 mgrms. in the blood is regarded as prognostically fatal. The details of the subject are chemically technical.¹³

Blood Morphology.—Fonio's work²⁰ on coagulation time reveals a further aspect of the present subject. He shows that cases in which there is hæmaturia of renal capillary origin should be investigated hæmatologically, by inquiring into the form and numbers of the platelets and the coagulation time.

For other sections of the subject, see URINE, CLINICAL PATHOLOGY OF).

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KIDNEY, SURGERY OF.

J. W. Thomson Walker, M.B., F.R.C.S.

Rytina¹ insists on the clinical value of *preliminary study of cases before operation on the kidney*. The great improvement in the mortality of nephrectomy which has taken place is, he holds, mainly due to the catheterization of ureters, the tests of the renal function, *x* rays and pyelography, and the bismuth and wax-tipped bougie. In illustrating the importance of the wax-tipped bougie, he rates, quoting Baetjer, the number of stones in the ureter that are entirely missed by the *x* rays at 30 per cent, a statement which few radiographers expert in urological work will be prepared to endorse. He discusses 111 cases operated by various surgeons at the genito-urinary department of the Mercy Hospital.

Goldstein² has investigated *the diagnostic and prognostic value of the estimation of blood urea in urology*. He first used Marshall's test, in which the serum only is used, and later Van Slyke's, in which the whole blood is used, calculating on the basis of per litre of blood, with a normal of from 0.3 to 0.6 gm. per litre. The number of cases investigated was 104. The author found that only rarely did a patient recover from an operation with a blood urea of more than 1 gm. per litre, and at no time was the prognosis grave from the urological standpoint with a blood urea of less than 0.75 gm. In cases with a blood urea between 0.75 and 1 gm. in which operation was necessary, only a fair prognosis was given, depending on whether the stationary point reached was a progressive decrease or a progressive increase in the amount of blood urea. It is important to have a series of blood-urea estimations made before operation. When an operation on the kidneys is necessary, estimation of the blood urea is not sufficient. It is necessary to estimate the relative renal function, and here the excretory tests, such as phenolsulphonephthalein, indigo-carmin, and urine urea, are indispensable.

Bugbee and Losee³ give a detailed account of the development of the kidneys and ureters, and record twenty-three cases of *congenital anomalies*. Cystoscopy, pyelography, and the use of opaque ureteric catheters are the means of demonstrating them. All but two of the cases presented renal

infections, a fact which the authors consider shows that such kidneys are particularly prone to infection. In treatment, lavage of the renal pelvis has been beneficial, and continuous drainage for several days with the ureteral catheter has proved efficacious. The surgical indications are to improve drainage and relieve pressure, if necessary by placing the kidneys more nearly in their normal position; to remove any obstruction to renal drainage, such as calculus; and to remove a hopelessly diseased kidney, or rarely one, with symptoms, which cannot be replaced.

Judd and Harrington⁴ record a series of 19 cases of *ectopic kidney*. The pelvic kidney in the female is prone to cause symptoms which simulate disease of the uterus and adnexa, and also menstrual disturbances. When the ectopic kidney is diseased, the symptoms are the same as when the disease is present in a normally-placed kidney. The diagnosis depends on the physical findings, the x-ray, and the kidney examination. The palpation of a tumour through the abdominal wall or rectum, especially in the absence of the kidney from its normal position, is suggestive of the condition. The absolute and relative fixation of the tumour, and often the palpation of the lobulations of a kidney, the depression of the hilus, and at times the pulsation of a large artery in its anterior wall, may be noted. The presence of genital malformation associated with a pelvic tumour should lead one to suspect ectopic kidney. Cystoscopic examination and pyelography give the most accurate information. The cystoscope may reveal pulsation in the trigone from an underlying large renal artery. The ureteral meatus is usually normal on both sides, but the ureter of the ectopic kidney is much shorter, and may be coiled and distorted. A pyelogram shows the abnormal position of the pelvis, and reveals stone or other disease. In many instances a pelvic kidney has been called an ovarian cyst. A pyonephrosis in an ectopic kidney has been mistaken for pyosalpinx. The most common error in diagnosis in the male is between an ectopic kidney and inflammation of the appendix. If the kidney is otherwise normal, it should not, under ordinary circumstances, be disturbed. A few instances have been recorded where a kidney in the pelvis interfered with pregnancy. In such cases it might be advisable to attempt to raise the kidney to a higher position. It is usually difficult to change the position of the ectopic kidney, because the blood-vessels in the pedicle are short, and the kidney is firmly fixed. In some cases, however, in which the kidney is producing symptoms such as would be caused by an intermittent hydronephrosis, although the function may be normal, it would seem advisable to attempt to change its position, and possibly to do a plastic operation at the point of obstruction. Where pregnancy occurs in a case of pelvic kidney, the authors prefer to wait until the late stages of pregnancy, and then do a Cæsarean section, rather than do nephrectomy early, as has been suggested.

Accidental occlusion of both ureters. Goyanes⁵ relates a case where an immense ovarian tumour was removed and a hysteromyomectomy done, with lateral section of the ligament and uterine arteries. The freeing of the bladder was very difficult. To stop hæmorrhage it was necessary to place continuous catgut sutures in the anterior and lateral walls of the vagina. Anuria followed the operation, and on the third day one ureter was exposed in the loin, found enlarged, and was drained. By sounding the ureter, it was found that the tube had been occluded by the catgut sutures at the base of the bladder. Cystoscopy on the fifth day after the operation showed that both ureters were occluded by ligatures near the bladder. On the fifteenth day, when the catgut sutures had become re-absorbed, spontaneous and voluntary micturition by the urethra became re-established. The author concluded that ureteral ligature does not necessarily cause permanent occlusion of the ureter, or its rupture.

By elimination of the urine through the fistula of the right ureter, the left kidney supported occlusion of its ureter for fifteen days.

Culver⁶ reviews the theories in regard to the routes of infection of the kidneys in *pyelonephritis*, and points out that the recent work of David supports the old idea of ascending infection directly up the lumen of the ureter. The organisms most commonly found are colon bacilli in 50 to 90 per cent of all cases, while the staphylococcus is found in 10 to 20 per cent. In a series of 116 cases, Culver found the *B. coli* in pure culture in 74 per cent, staphylococci in pure culture in 8 per cent; while 85 per cent of all cases were infected with colon bacillus in pure or mixed infection, and 16 per cent of all cases contained staphylococci in pure or mixed infection. Other organisms—streptococcus, typhoid bacillus, *B. pyocyaneus*, and diphtheroid bacillus and leptothrix—were found, but altogether they represent less than 5 per cent of all the infections. Of 116 cases, 58.7 per cent had bilateral infection, and 41.3 per cent unilateral; while 48 per cent of the latter affected the left kidney, and 52 per cent the right. If urethral or ureteral obstruction is found to be present, it is imperative that this be relieved, and also that septic foci in the body should be removed. Urinary antiseptics are important in treatment. **Hexamine** is given in doses of 10 gr. increased to 15 gr.; and in patients intolerant of this drug, **Salol** should be given. Lavage of the renal pelvis with 1 per cent **Silver Nitrate** may be useful.

Bugbee⁷ discusses the *renal complications of pregnancy*, and suggests that pregnant women should be more carefully examined in the early stages of pregnancy with a view to prophylaxis. The kidneys are from a number of causes particularly susceptible to infective lesions during pregnancy. The work done is greater owing to the metabolism of the fœtus, the skin is less active, there is diminished activity affecting the stomach and bowel, and the intra-abdominal pressure is increased. Bugbee states that there is lowered resistance of the pregnant patient, which allows focal infections to become more active. Pressure on the ureter by the fœtus has been given as an important factor in localizing the renal infection. The ureters, particularly the right, have been found dilated and filled with urine in about two-thirds of the pregnant women examined post mortem. This has been attributed to torsion, stretching, or kinking of the ureters, due to the enlargement and dislocation of the pelvic organs, but not to compression, since the specific gravity of the pregnant uterus is said to be equal to that of the intestinal mass. The pressure in the pelvis of the kidney is only 10 mm. of mercury, so that slight causes may lead to the stopping of the flow of the urine in the ureter. An important part of the treatment is prophylactic. Early examination of the urine and the treatment of existing infection, careful attention to the intestinal tract, and examination of the nose, mouth, etc., for focal infection, are recommended. Whether or not a woman should attempt to go through a pregnancy with a renal lesion present is a question to be decided in each case. Renal tumours, calculi, and infections may call for surgical interference such as nephrotomy or nephrectomy. When kidney infection is already present, drainage by the ureteral catheter, with retention of the catheter, and lavage of the renal pelvis, may be necessary. If relief is not obtained, termination of the pregnancy is to be considered, and some operation such as drainage of the kidney or nephrectomy.

Herman⁸ refers to the *difficulties in diagnosis and treatment of unilateral renal tuberculosis*. Unfortunately the principal symptoms are caused by extension of the disease, and the patients come for examination at a comparatively late period. The prognosis in tuberculosis of the urogenital system is favourable in direct ratio to the degree of limitation of the disease in the structures

primarily involved. In the great majority of males, the primary cystoscopic examination demonstrates involvement of the ureter, together with the bladder wall adjacent to the orifice. Bladder involvement with ulceration at points distant and separate from the ulceration surrounding the meatus of the ureter signifies unusual susceptibility of the bladder mucosa to tuberculous infection, and has grave prognostic significance. Secondary deaths following nephrectomy for unilateral renal tuberculosis are due, in the majority of instances, to extension of the disease, with ultimate involvement of the opposite kidney. Primary tuberculosis of the bladder is regarded by Herman as occurring in rare instances. He quotes a number of cases that might be of this nature, but in none of them is there convincing proof of its primary distribution.

In an article on *x-ray diagnosis in renal tuberculosis*, Braasch and Olson⁹ draw the following conclusions. Routine x-ray examination is advisable in every case in which there is infection in the urinary tract. Shadows may be found in approximately 20 per cent of patients with renal tuberculosis. Positive evidence of tuberculosis may be obtained by this method when all other clinical data fail and when cystoscopic examination is impossible. Shadows due to renal tuberculosis may be arranged into three groups. In the first group, the small scattered areas are generally caused by lime deposits. They are occasionally seen singly, and appear as elongated, irregular, faint streaks, or as multiple punctate areas, scattered over a large portion of the kidney, usually in one of the poles. The second group, representing single or several isolated areas of concentrated calcareous deposit, is the type most easily confused with stone. There may be an irregular shadow of 1 to 3 cm., less opaque than a stone shadow; a shadow which is very irregular in outline and consistency; or definite shadows with the density and contour of a stone. The third group has large regular rounded shadows of variable density. They may assume the outline of a complete cast of the kidney, and are usually irregularly lobulated. Calcareous deposit may occur with tuberculosis in the ureter, although less frequently than in the kidney. The calcareous deposits may lie in the wall or within the ureter. Such deposits are usually accompanied by similar caseation in the kidney. Evidence of renal tuberculosis provided by the x rays may be of value in determining the existence of bilateral involvement, or that the patient is otherwise inoperable. If the bladder is in such a state that it is impossible to make a satisfactory cystoscopic examination, a shadow of calcification in one kidney area may be of considerable diagnostic value.

Spooner¹⁰ has studied the *bacteriology of tuberculous kidneys*, and formulates certain conclusions. The tubercle bacillus can be cultivated in pure culture from tuberculous kidneys. In 10 kidneys examined, positive results were found in 5. In no instance was there any evidence either in the kidney or the ureteral urine of mixed infection. Tuberculous caseation and suppuration is due to the tubercle bacillus alone, without secondary infection with pyogenic organisms. The clinical diagnosis of renal tuberculosis is suggested by the presence of acid-fast bacilli in the urine.

Rovsing¹¹ reviews his twenty-five years' experience in the diagnosis and treatment of *renal calculi*. The total number of patients was 533. Of these, 185 had a hæmatogenous infection, and 348 were aseptic cases. Diet was considered important as a causative factor. Pain and hæmaturia were the first symptoms, and phosphaturia might be present in large calculi. The majority of phosphatic calculi were, the author considered, due to artificial phosphaturia, caused by the prolonged drinking of mineral waters, perhaps taken to combat the very condition that they increased. Careful diagnosis was required to differentiate stone from appendicitis. The clinical findings

might be positive and the x-ray examination negative; phosphatic and urate calculi cast only a slight shadow, and their detection in the obese may be impossible; in 32 of 195 cases in which calculi were found at operation, the x-ray findings had been negative, and in 6 other cases had been misleading. For the treatment of nephrolithiasis, Rovsing advises the **Copious Drinking of Distilled Water**, which flushes the kidneys and leaves no deposit. The stone will be affected only when it is a urate or oxalate, and small in size. This treatment is advantageous in infected cases to get rid of toxins and bacteria before operation. It may transform an inoperable into an operable case, or keep the patient in good condition without operation for a long period. After operation the drinking of distilled water is continued. In 224 cases the urine was aseptic. In the infected cases the *B. coli* was the most frequent organism. In 58 cases bilateral calculi were found, and in 63 cases calculi were present in the ureter. There was anuria in 10 cases. Of the 533 patients, 295 were operated upon, as follows: nephrolithotomy, 202; pyelolithotomy, 8; nephrectomy, 55; ureterolithotomy, 30. There were 29 deaths, a mortality of 13 per cent.

The following observations occur in an article by Barney¹² on urinary calculi. The coating of obscure stones in the renal pelvis with silver salts is of comparatively little value in diagnosis. A ureteral calculus may not produce a scratch upon a wax-tipped catheter. Very small calculi in the lower ureter generally pass out spontaneously; owing to the difficulty in recovering them at operation, every palliative measure should first be tried, especially dilatation of the ureter, either by a simple ureter catheter, or by the scissors through an operating cystoscope. Vesical calculi should be removed by lithotripsy and litholapaxy. In cases of bilateral renal stone, the better kidney should be operated on first; or, in favourable conditions, both can be done at the same time. The frequent passage of calculi from one kidney indicates the presence of an abnormal condition in that organ, and this can not only be demonstrated, but can be remedied in most instances. With a calculus pyonephrosis, and a stone in the lower ureter on the same side, nephrectomy can be done without interfering with the ureteral calculus. The latter will produce no further disturbance.

Meyer¹³ records two cases of *spontaneous perirenal hæmorrhage*. In one case there was an ascending infection of the kidney, with multiple abscesses, and an erosion of an arcuate artery, with the formation of a small crater-like tear in the lower pole. The cause of the second case was not discovered. Meyer states that severe pain in the kidney region, the presence of a tumour-like mass of variable dimensions, hæmaturia, and evidence of internal bleeding are the important symptoms of diagnosis.

REFERENCES.—¹*Med. Rec.* 1919, Aug. 23, 311; ²*Jour. Amer. Med. Assoc.* 1918, Dec. 14, 1957; ³*Surg. Gyn. and Obst.* 1919, Feb., 99; ⁴*Ibid.* May, 446; ⁵*Ibid.* (abstr.) July, 53; ⁶*Ibid.* March (abstr.) 257; ⁷*Jour. Amer. Med. Assoc.* 1918, Nov. 9, 1538; ⁸*Ann. Surg.* 1919, Aug., 203; ⁹*Surg. Gyn. and Obst.* 1919, June, 555; ¹⁰*Jour. Med. Research*, 1918, xxxix, No. 1; ¹¹*Surg. Gyn. and Obst.* 1919, July (abstr.), 52; ¹²*Surg. Gyn. and Obst.* 1919, April, 340; ¹³*Jour. Amer. Med. Assoc.* 1919, May 17, 1451.

LABOUR.

W. E. Fothergill, M.D.

The Funnel Pelvis.—H. Williamson¹ reports upon labour in 106 cases of funnel pelvis, which he defines as one which has a normal inlet, but in which one or more of the diameters of the outlet are reduced. Measurements were made in 1579 women, of whom 123 (7.7 per cent) were found to have pelvises of the funnel type. The transverse diameter at the outlet should be 11 cm., and when this measurement was 8 cm. or less the outlet was regarded as contracted. The conjugate of the outlet is of less importance. Pubiotomy was done in

2 cases; labour was induced prematurely in 3, one of whom required Cæsarean section later; and 4 other cases were delivered by Cæsarean section. Operative delivery was required in 41 cases, while 65 labours ended spontaneously. The narrow pubic arch is not available for the passage of the head, which thus passes backward and presses strongly on the perineum. Thus severe perineal tears are the rule in cases of this kind. In the 106 cases there were 53 perineal lacerations, 3 of which extended into the rectum. Episiotomy was used three times, and it is advised for all cases in which it is seen that a bad tear is likely to occur. Williamson concludes that Cæsarean section should be done in all cases of extreme outlet contraction. In moderate cases the induction of premature labour is a legitimate method of management. Pubiotomy is advisable in certain cases where the forceps has failed. A transverse diameter of 7.5 cm., with a conjugate of the same size, is consistent with spontaneous labour. In delivering the head through the outlet with forceps, the exaggerated lithotomy position is useful, as it increases the conjugate of the outlet (Walcher's position reduces this diameter and increases the conjugate of the brim). He considers the funnel pelvis to be the usual cause of deep perineal tears.

Forceps Rotation in Occipito-posterior Cases.—A. H. Bill² has rotated the head by means of forceps in 249 cases without failure or complication. An absolute diagnosis of the position is made, and due time is allowed for spontaneous rotation. The blades of the forceps are then carefully applied to the sides of the child's head, a true cephalic application without reference to the pelvis. The rotation is then made without any traction whatever, the handles of the forceps being carried round in a wide sweeping movement, first towards the patient's thigh and then backward. The large sweeping movement of the handles allows the blades to remain in the same axis during the rotation. The forceps is now 'upside down', and must be removed and re-applied to the head, whose position is now occipito-anterior. This device is said to be much easier and more certain than manual rotation. It can be done with the head high or low in the pelvis, and is facilitated by pushing the head up a little before rotation is begun. Traction in any case is to be carefully avoided until the head has been turned, and the forceps removed and re-applied.

Version in Normal Labour.—Three years ago, Dr. J. W. Potter, of Buffalo, N.Y., reported to the American Association of Obstetricians 500 cases of internal version, mainly in normal cases, and undertaken in order to shorten the act of labour, thus preserving the vitality of both mother and child, and saving the time of the accoucheur. Dr. Potter claimed that his maternal and fetal morbidity and mortality were less than those obtained by average obstetricians. Dr. Potter was denounced by those present at the meeting, and his paper was refused publication. A year later he reported to the same Association 200 cases of version done during the previous year, with hospital records of every case. He was again denounced, but his practice was strongly supported by Dr. H. E. Hayd, who had followed Potter's work, found his patients free from injury, and noted their prompt and perfect recovery. The two papers were then published. When the Association met in 1918, G. Zinke³ described a visit paid to Dr. Potter by himself in order to witness some cases and to observe the method of version used. The patient is fully anesthetized. The left hand is used without reference to the position of the child. The patient lies on her back, the buttocks at the edge of the table or bed; the legs are not flexed on the abdomen, but are loosely held by two nurses. During delivery of the head they are allowed to drop into what is practically the Walcher position. The cervix must be either dilated or easily dilatable. If dilatation is not complete, it is completed by the fingers after the whole hand has been gradually passed into the vagina. When the membranes are ruptured and the hand enters the

uterus in search of both feet, the vulva is plugged by the thick of the forearm, so that but little liquor amnii escapes. Both feet are pulled down to the vulva. The body of the child is expelled by uterine contraction, no traction being made. When the scapula is born, the anterior arm is delivered and then the posterior arm. With the right hand the head is then pressed into the pelvis from above, and the index finger in the child's mouth makes gentle traction from below. The child's mouth and nose are thus brought to the vaginal outlet, so that the child can breathe, and there is no hurry about the delivery of the head. Zinke says that at present every obstetrician, the world over, will condemn this use of version in normal labour to save suffering and time. Indeed, the whole profession will be a solid bulwark against this practice, but not for ever. He is convinced that Dr. Potter is right, and will in time secure a large following.

In the discussion of Zinke's paper, Dr. Potter himself took part. During the year he has delivered personally 746 women, using version on 508 occasions. This makes a series of 1208 cases, without a single maternal death, and "with a less foetal mortality than I would have had by any other method". The only objection raised against the free use of version was that, if it were sanctioned by obstetric authorities, it would be abused, with great destruction of human life, by the unskilled. Zinke replied that this objection applies with equal force to everything we do in medicine and surgery. "He who does not know how to do a thing right should not do it at all. It is true that many men perform operations for which they have not been trained". All new operations have been viciously denounced. It is possible that the new generation of obstetric artists will be trained to do version well and will use it freely.

[There have been skilful and enthusiastic 'turners' before Dr. Potter. A very old practitioner in a country town in the south of Scotland used to say that Providence had made one gross mistake, and that was in letting children be born head foremost. During a long life he had always prevented this when possible, and he always turned if he arrived at a confinement in time to do so. The forceps is constantly used to shorten labour and save the time of the accoucheur; as, for example, by the author of a paper describing 200 consecutive labours with forceps delivery in 198 of them. If it is legitimate at all, in the interests of mother, child, and accoucheur, to deliver as soon as dilatation is complete, then, given the necessary skill, turning may be as good a method as forceps, or possibly better.—W. E. F.]

REFERENCES.—¹*Amer. Jour. Obst.* 1918, Oct., 528; ²*Ibid.* Dec., 791; ³*Ibid.* 829, 897.

LACHRYMAL GLAND, AFFECTIONS OF. (See also EYE AND ORBIT, TUMOURS OF.)

R. Foster Moore, F.R.C.S.

Professor Calderaro¹ supplies an important contribution to the clinical pathology of the secretion of the tears, a subject upon which little good work has been done. The following are a very few of his important observations and conclusions. Continuous epiphora after destruction of the lachrymal drainage system is usually dependent upon an abnormal hypersecretion of the lachrymal glands; this is cured by removal of the orbital portion of the gland, and with greater certainty by removal of the palpebral portion. After removal of the orbital gland there is a period of two to six days during which the conjunctiva is very sparingly lubricated; the condition then improves, and the moisture becomes sufficient to keep the conjunctiva in its normal condition. After removal of the palpebral portion there is an abrupt disappearance of secretion, owing to the simultaneous suppression of the contribution from the orbital portion. There is then a period of about ten days, during which the conjunctiva becomes xerotic; if, however, the conjunctiva is healthy, lubrication slowly improves, owing to a hypersecretion of the subconjunctival glands.

PLATE XXI.

INTRANASAL DACRYOCYSTOSTOMY

(PATERSON AND FRASER)

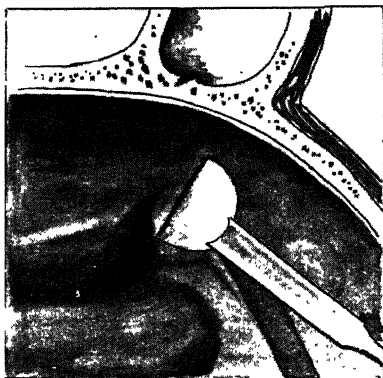


Fig. A.—A D-shaped area of mucous membrane has been removed, the inner surface of the frontal process of the left superior maxilla exposed, and the gauge applied.

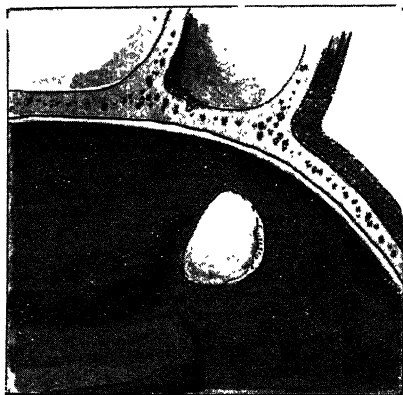


Fig. B.—The bone exposed has been removed, and the dilated tear sac bulges into the wound.

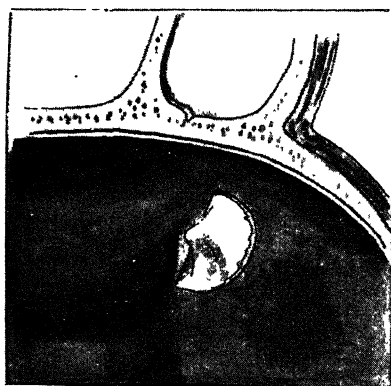


Fig. C.—A lacrimal probe is now passed through the lower punctum and canaliculus into the sac and pressed against the inner wall so as to 'tent' it.

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PLATE XXII.

INTRANASAL DACRYOCYSTOSTOMY—continued

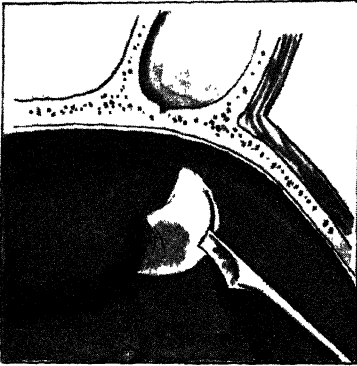


Fig. D.—While the sac is 'tented' inwards, a long bistoury is used to incise the inner wall.

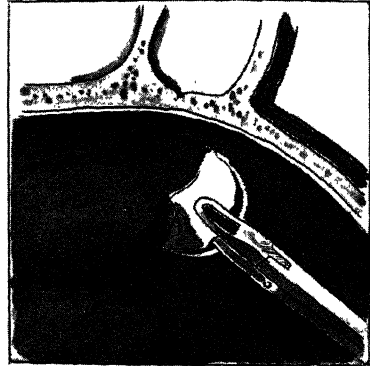


Fig. E.—With the probe still in position, the 'female' blade of a small nasal 'double cutting' forceps is introduced into the sac. On closing the blades a portion of the inner wall of the sac is removed.

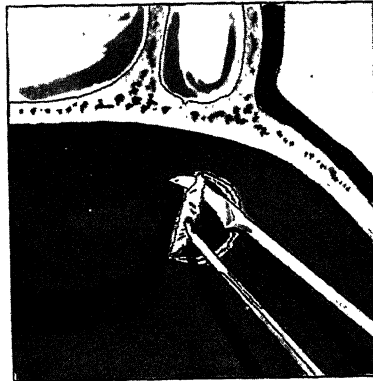


Fig. F.—As an alternative to the procedure indicated in *Fig. E*, the inner wall of the opened sac may be grasped with Paterson's mouse-tooth forceps and drawn inward to facilitate its excision with the small curved bistoury as shown above.

In trachoma the subconjunctival glands are much damaged; removal of the lachrymal glands therefore in this disease is entirely contra-indicated. The microbic content of the conjunctival sac in the case of abundant epiphora following removal of the sac is very scanty and inactive; on the other hand, on removal of the lachrymal glands the microbic content, especially of pathogenic organisms, is increased.

Treatment of Dacryocystitis.—Any really efficient means of dealing with this condition will be greatly welcomed. Thompson² speaks highly of a new method for its treatment which he has devised. He suggests in the first place that often the original cause of the condition is entanglement in the lining mucous membrane of small foreign bodies passing down the duct from the conjunctival sac. These give rise to irritation, and collect a deposit of salts upon themselves and so cause obstruction. The line of treatment adopted is first to *incise* freely the lower canaliculus, and then freely to curette the sac and duct with a flexible wire aural curette. The author states that the sac and duct should never be irrigated after operation, and he believes that every type of dacryocystitis can be cured and the function of the duct restored. If this can be done the method is clearly superior to any intranasal operation or to removal of the sac.

In contrast with the above, Kearney³ advocates slitting the canaliculus and introducing a leaden style, or removing the sac by means of a curette introduced through an incision which opens each canaliculus, and then incising the sac through this opening. This seems to have no real advantage over removal of the sac through a facial incision.

A valuable contribution to the literature of intranasal dacryocystostomy is the report by J. V. Paterson and J. S. Fraser⁴ of 50 consecutive operations. The authors' enthusiasm for the operation seems to be justified by the results. Of the 50 cases all but 7 were in females. In 27 cases the nose was normal; in the remaining cases the findings were so various that it was clearly impossible to ascribe the condition to any particular nasal lesion. The technique is sufficiently indicated in *Plates XXI, XXII*. A local anæsthetic is recommended. The difficulties are several: in children lack of space; in some cases the bone is very thick and takes a good deal of hammering; occasionally it is necessary to remove the anterior end of the middle turbinal bone; sometimes anterior ethmoidal cells are opened in mistake, but this is recognized from the bluish colour of the bulging mucosa instead of the opaque white of the lachrymal sac. The operation takes about fifteen minutes. Of the 50 patients, the condition of 48 is known from three months to three years afterwards; 24 of these were examined personally by one of the authors. They state that, of the 48 cases, 36 may be regarded as complete cures.

Mikulicz' Disease.—Delzet⁵ reports the case of a soldier who developed swelling of both lachrymal glands, both sublingual glands, and cervical and axillary lymphatic glands. The lachrymal glands were removed. Inoculation experiments with portions of them were negative. The author divides the cases to which the name Mikulicz's disease is applied into: (1) Simple lymphadenoid enlargement; (2) Lymphomatose infiltration; (3) Chronic inflammatory; (4) Possibly sometimes tuberculous or syphilitic.

REFERENCES.—¹*Ann. d. Ottal. e. Clin. Ocul.* 1917, Jan.; ²*Jour. Amer. Med. Assoc.* 1918, ii, 1727; ³*Med. Rec.* 1918, ii, 587; ⁴*Brit. Jour. Ophth.* 1919, May, 197; ⁵*Klin. Monatsbl. f. Augenheilk.* 1917, Sept.—Oct.

LARYNX, ACROMEGALY OF.

P. Watson-Williams, M.D.

Four cases of acromegaly with definite laryngeal involvement are recorded by Chevalier Jackson¹ (*Fig. 33*), who remarks that although a number of cases of acromegaly with alteration of the voice have been described, the literature

contains but little reference to the larynx. Hence the observations and illustrations afforded by the author are of special value and interest. All the four cases were well-marked and undoubted examples of acromegaly. *Case 1* had repeated 'asthmatic attacks', culminating in severe dyspnoea requiring tracheotomy. The larynx was enormous, with even, symmetrical enlargement, and laryngoscopic examination showed a general overgrowth, with a very narrow glottic chink deviated to the left. The whole laryngeal image,

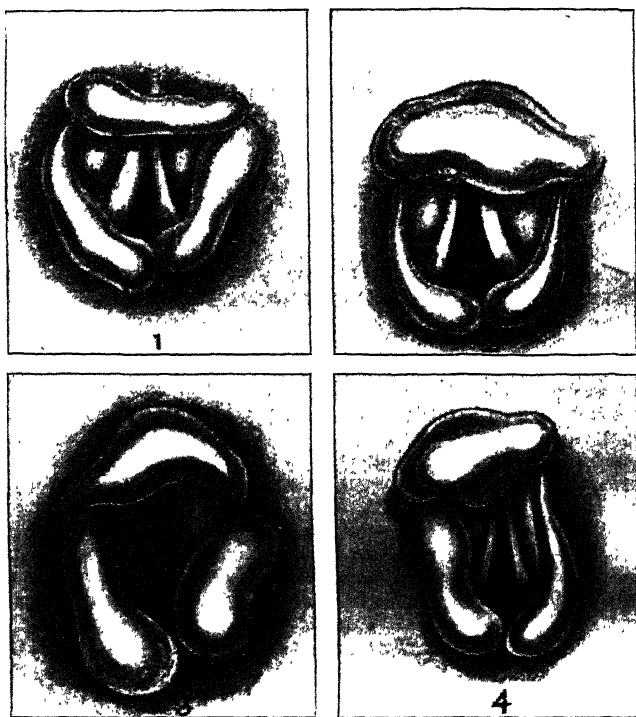


Fig. 33.—Acromegaly of the larynx.—The enlargement and thickening of the various prominences of the larynxes are bilateral. The asymmetry seems rather a distortion, though at (4) is shown a larynx with elongation of one aryepiglottic fold associated with thickening of its fellow. The larynx shown at (3) was so suggestive of the typical acromegalic bands as to merit the appellation of 'gingerbread larynx'. The whole larynx by external palpation seemed symmetrically enlarged in all cases except the one shown at (2), in which the overgrowth was limited to the epiglottis. (Reproduced from the 'Journal of the American Medical Association'.)

owing to the diffuse thickening of the epiglottis, ventricular bands, and aryepiglottic folds, gave an image strongly suggestive of the facies and 'gingerbread hands'. *Case 2* had a harsh, weak voice, the larynx was obviously enlarged, and laryngoscopic examination showed that the epiglottis was thickened as well as the left aryepiglottic fold. *Case 3*, a female, had a masculine voice; the epiglottis was thickened and turban-shaped, suggestive of laryngeal tuberculosis, but the thickening was more irregular, and all the usual appearances of laryngeal tuberculosis were absent. *Case 4* showed marked antero-posterior

enlargement of the larynx, the epiglottis three times as thick as normal, and the mucosa chronically inflamed. Cases 2 and 3 were referred as cases of laryngeal tuberculosis, and Case 4 as one of laryngeal lupus. Jackson states that he does not think anyone could make a diagnosis of acromegaly by laryngoscopic examination alone: it would require the corroboration of general symmetrical symptomatology. The report here referred to affords this corroborative evidence, and also cites the röntgenographic findings.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, Nov. 30, 1787.

LARYNX, AMYLOID TUMOURS OF.

P. Watson-Williams, M.D.

Four examples of these rare tumefactions in the larynx are described and illustrated by New,¹ and from a review of other published cases he recognizes three types: (1) Diffuse subepithelial infiltration; (2) Tumour forming local amyloidosis; (3) Amyloid degeneration of a pre-existing tumour. When the larynx or trachea is involved, the symptoms are such as accompany benign neoplasms of slow growth. The differential diagnosis from gumma, or even malignant growth, is sometimes difficult, and in most cases must be made from microscopical examination of removed fragments.

REFERENCES.—¹*Laryngoscope*, 1919, June, 322.

LARYNX, ASSOCIATED PARALYSIS OF.

P. Watson-Williams, M.D.

The recurrent laryngeal nerve supplies all the intrinsic muscles of the larynx except the cricothyroid, and thus a lesion of the recurrent nerve or of the fibres of this nerve in the vagus alone—e.g., by the pressure of an aortic aneurysm—manifests itself simply by vocal-cord paralysis, i.e., it is a simple 'recurrent' paralysis. But the vocal-cord paralysis may be complicated by being associated with a paralysis of the spinal accessory, pneumogastric, or hypoglossal nerve; it is then an 'associated' laryngeal paralysis, and the position of the lesion can be determined by anatomical considerations. In 1915 Vernet isolated as a clinical entity examples of hemiplegia of the soft palate, larynx, and pharynx, the characteristic syndrome of the three nerves of the foramen lacerum posterius. In the course of a recent contribution on the classification of associated laryngeal paralyses, Vernet¹ introduces a schema illustrating the seat of lesion in various recognized types (Fig. 34). He reminds us that the syndromes are as follows:—

- a. TAPIA.—Paralysis of the tongue on one side and of the larynx on the same side.
- b. AVELLIS.—Palato-laryngeal hemiplegia.
- c. SCHMIDT.—Paralysis of the soft palate, of the larynx, and of the neck muscles (sternomastoid and trapezius).
- d. VERNET.—Hemiplegia of the soft palate, larynx, and pharynx.
- e. HUGHLINGS JACKSON.—Homolateral paralysis of the larynx, soft palate, tongue, and muscles of the neck.
- f. COLLET-SICARD.—Total hemiplegia of the last four cranial nerves.

REFERENCE.—¹*Jour. Laryngol. Rhinol. and Otol.* 1918, Dec., 354.

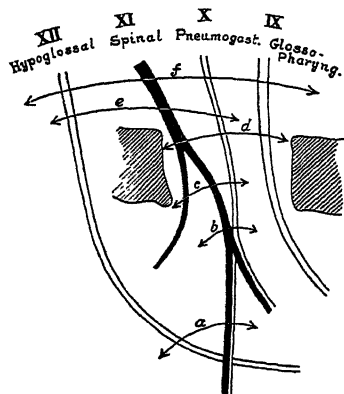


Fig. 34.—Vernet's schema representing by nerves the syndromes of associated laryngeal paralysis. a, Tapia; b, Avellis; c, Schmidt; d, Vernet; e, Jackson; f, Collet-Sicard. (Reproduced from the 'Journal of the American Medical Association'.)

LARYNX, CANCER OF.

P. Watson-Williams, M.D.

StClair Thomson,¹ in reviewing his methods and results, states that he has operated on 38 cases of intrinsic laryngeal cancer, and that of these 22 are alive and well without recurrence at periods varying from six months to ten years since the operation; 7 cases survived the operation and died from other causes at periods varying from ten months to ten years after the operation. Local recurrence took place in 5 cases. He states that his experience confirms the view that, as Semon pointed out, the first year after operation is the anxious one as regards recurrence.

As regards the operation, Thomson advocates one long incision from the thyroid notch to the sternum, instead of two incisions, one over the larynx and one for the tracheotomy. He prefers a tracheotomy preliminary to the laryngofissure; it guards against the danger of any unexpected hæmorrhage, and protects the lower air-passages from the descent of blood and secretion. He now abandons the use of a Hahn's tube, substituting a packing of knotted ribbon gauze tucked through the divided thyroid cartilage on to the top of the tracheotomy cannula.

As a rule the tracheotomy tube is withdrawn from the neck as soon as the operation is completed, and is not replaced; but if there is a tendency to bleeding, the tube is left in from twenty-four hours to as long as eighteen days.

After operation, Thomson places his patients in bed with a bed-rest in such a position that they are almost sitting upright; and the same evening many of them sit out of bed and are able to drink sterilized water.

For operations on the larynx for malignant growths, Arrowsmith² advocates rectal anæsthesia, as it makes the whole procedure infinitely easier for both patient and operator; for laryngeal spasm does not occur, bleeding is very much less, there is no tracheobronchial irritation, and much less likelihood of post-operative vomiting. He upholds laryngectomy as giving the patient a chance in cases where less radical measures cannot allow of complete removal of the growths. Of two cases operated on by the author, one died six weeks later of pneumonia, while the other was working six months after the operation.

An ingenious procedure for the restoration of a vocal cord to replace the one removed for malignant growth has been described by F. N. Smith.³ In his patient, age 62, the anterior three-fourths of the cord having been removed, with all the soft parts in a wide area extending down to the thyroid cartilage, a previously prepared skin flap containing a small piece of cartilage was trimmed and sewn into the denuded area; it became attached, and the skin pedicle was divided, leaving the new cord *in situ*, and the author states that it left the patient with a good voice. The new vocal cord flap was prepared by making two short parallel incisions just above the nipple and inserting a small piece of septal cartilage under the skin. When the growth was removed, the flap vocal cord was dissected off, and a broad pedicle formed of skin extending to the suprascapular region, and then the distal end containing the piece of cartilage was sutured into the larynx to correspond with the removed real cord. The voice was eventually said to be quite good, with only slight huskiness.

[It is remarkable, however, what a good voice has often been obtained by the cicatrix that results after removal of a vocal cord for malignant growths without any plastic operation at all—as far as one can judge from verbal descriptions, quite as useful as in the case here reported.—P. W.-W.]

REFERENCES.—¹*Jour. of Laryngol.* 1910, March, 145; ²*Surg. Gyn. and Obst.* 1918, Dec., 515; ³*Lancet*, 1919, i, 108.

LARYNX, STENOSIS OF. (*See also* TRACHEA, DISEASES OF.)*P. Watson-Williams, M.D.*

Laryngeal stenosis may arise from transitory inflammatory conditions requiring tracheotomy, and similarly tracheotomy may be demanded for tracheal stenosis above the tracheotomy. But when the conditions causing the respiratory obstruction have subsided, it is not infrequently found that the intrinsic laryngeal muscles have ceased to functionate as the result of disuse, and consequently the tracheotomy tube has to be continued. Chevalier Jackson¹ advocates corking the cannula as most valuable in the treatment of such cases, a method which has alone cured many of them. It consists in corking the cannula with a specially-shaped rubber cork that does not completely occlude it. The amount of leakage past the cork can be regulated so as to force the patient to make strong inspiratory efforts to get sufficient air, or the effect is to increase the lumen of the larynx by increasing the mobility of the crico-arytenoid joint when that is impaired by local lesions. Chevalier Jackson has found that corks made of cork-bark, and even of ordinary rubber, are unsuitable; they become friable, so that crumbs of cork or rubber are apt to be inspired. He therefore advocates a cork made by grinding 'pure rubber cord' of suitable size on a high-speed emery wheel. The various forms of cork are illustrated (*Fig. 35*). When the patient can wear a 'one-third' cork in his cannula

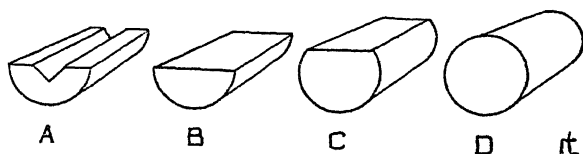


Fig. 35.—Pure rubber corks of various shapes for corking tracheotomy cannulas. A, Cork with large by-pass, called a 'three-quarter cork'; B, a 'half cork'; C, a 'one-third' cork; D, a 'whole' cork.

with ease and comfort, the half cork should be substituted, and then later, after wearing this until the glottic lumen is increased, the three-quarter cork should be tried. If necessary, this cork can be ground down, making a two-third cork. Again, later, when the patient can exercise and sleep quietly with the complete cork in place, he is ready for decannulation. In old cicatricial cases a few weeks or a few months may be required, and Jackson observes that in most of the long-standing cases it is well to watch the case through an attack of 'cold' or acute laryngotracheitis before final decannulation. Obviously, if the cannula fitted closely to the tracheal walls, the method would be impossible, as the patient would be asphyxiated by complete corkage; but, as Jackson reminds us, a properly-fitted cannula never occupies more than half the total area of cross-section of the tracheal lumen. If there is very much purulent secretion coming up from the air-passages, it is often wise to postpone the corking treatment or any attempt at decannulation until the secretion is diminished, or until assured that the patient can remove all pus or other secretion. All the details of treatment of laryngeal stenosis and of decannulation as practised in the author's clinic have been published. The present article is limited to the uses of corks, the important curative qualities of which do not seem to have been recognized.

The results, and the apparent therapeutic mechanism by which these are obtained, may be summarized as follows: (1) One of the most important results is the prevention of the atrophy of the intrinsic muscles. (2) Not only is the atrophy prevented, but also the voluntary use of the accessory

respiratory muscles seems to have increased their power in many cases. (3) There is reason to believe that the column of air forced through the larynx in forced respiration has some effect in dilating the larynx. (4) The forced respiration keeps the larynx freed of secretions which are more or less purulent, and hence irritating. (5) The patient can cough effectively, because all the air does not leak out of the neck; and, in addition, the part normally taken by the larynx in the hecic cycle is increasingly restored as the treatment is continued.

REFERENCE.—¹*Laryngoscope*, 1919, Jan., 1.

LARYNX, TUBERCULOSIS OF. (See TUBERCULOSIS, LARYNGEAL.)

LARYNX, WAR NEUROSES OF.

P. Watson-Williams, M.D.

Smurthwaite,¹ with an experience gained from 262 cases under his care—viz., 13 of absolute mutism, 239 of aphonia, and 10 of stammering and stuttering—distinguishes four varieties: (1) The dumb, as a rule listless and depressed and showing signs of nervous exhaustion, and some unable to walk; (2) The voiceless, speaking in a whisper, falsetto, or in a juvenile voice; (3) The stammerer and stutterer; (4) The malingerer.

The treatment of these patients Smurthwaite deals with under two headings, (a) moral, (b) physical, the former being by far the more important. Moral treatment consists in gaining control over the patient; "We speak to the patient with firmness, confidence, and conviction in our ability to absolutely restore his natural voice, and we succeed". As regards physical treatment, Smurthwaite recognizes that two classes of cases have to be dealt with: (1) Those where there is lack of sufficient obstructive pressure to the expiratory blast; (2) Those where the obstruction is excessive and the expiratory blast not powerful enough. He makes the patient expand the chest by deep breathing; then, when the man is able to breathe deeply, he tells him to hold the breath at the full expansion of the lungs and make a quick expiratory effort or cough; as a rule a good note can be elicited by this simple method. In the most obstinate cases where there is an increased tension or tonic spasm, we have to overcome this either by increasing the upward pressure of air, or in some way making the patient relax the cords. "To assist him in the expiratory effort, I place my hands on the lower ribs, the thumbs pressing just below the xyphoid cartilage, and use compression, directing him to use his abdominal muscles forcibly to phonate the sound 'ah'. If this fails, make him forcibly groan, at the same time withdrawing the tongue. The placing of a laryngeal probe directly into the larynx will have the effect of relaxing the pressure if the patient be told to cough at the same time. By these means we eventually succeed in eliciting the first musical sound we are trying for".

REFERENCE.—¹*Jour. Laryngol. Rhinol. and Otol.* 1919.

LATENT DISEASE, DIAGNOSIS OF.

Oskar C. Gruner, M.D.

Scattered through the recent literature are evidences of a search for precise and yet easily applied tests which will enable the practitioner to detect disease in its earliest stages, or assess the state of a person who has passed through acute illness but remains more or less incapacitated by what is accepted to be a permanent disablement. Although the problem is met when the functional capacity of the various viscera is determined (see VITAL-FUNCTION TESTS), yet there are certain diseases in which an idea of the activity of the disease or of its degree of severity is necessary (e.g., in Pensions Board work). The chief diseases which are to be considered are (1) Malaria; (2) Syphilis; (3) Tuberculosis; (4) Chronic renal disease; (5) Malignant disease.

A disease is said to be *latent* when it is in one of the following forms¹: (1) A condition actually present, but in a site where not easily discerned; (2) A condition actually present, but only in histological quantity; (3) A condition morphologically present, but functionally inactive; (4) A condition not actually present, but tending towards actualization.

Malaria may be considered latent when there is no physical or subjective evidence of disease, and yet the existence of parasites lodged in internal organs is proved by an attack occurring after a long interval. Syphilis, it is probably correct to say, is more often latent than declared after the subsidence of the first lesions. Tuberculosis is latent when the physical evidences are difficult to detect, or when the subjective symptoms divert attention from the real focus of disease; it may be latent in the fourth sense. Chronic renal disease may be latent in the second and third senses. In each of these cases, however, we start off with a knowledge that the patient has had the disease, so that the matter at issue is, How far is he to be regarded as suffering from it *now*? Although there are special points to consider under each heading, the endurance tests and other methods of determining functional capacity cannot be ignored. Hence the detection of latent disease is *via*: (1) Special work-tests; (2) Special clinical laboratory processes.

WORK TESTS; ENDURANCE TESTS.—These are applied in the diagnosis of functional disorder of the heart, and in the disposal of cases of chronic nephritis. In the German Army, the following tests were used²: (a) Food resistance tests: increase of protein and salt in the diet up to ordinary diet; the urine is the criterion. (b) Exercise resistance tests: these apply chiefly to the convalescent period when the patient is first allowed up; the urine is examined for amount of albumin and presence of red cells, and the states of the heart and circulation are noted. (c) Cold resistance tests: in the form of shower- and foot-baths of varying grades of temperature. (d) Work resistance. The details to be used will present themselves at once, and need no description.

BODY-RESISTANCE TO INFECTIONS.—See BLOOD, CLINICAL PATHOLOGY OF. SPECIAL LABORATORY WORK.—

1. *Malaria*.—The first important point lies in the fact that the examination of blood-films for parasites is useless in cases that have returned to civilian life. It is true there are hematological *minutiae*, especially in the direction of a persistent increase of the large mononuclear leucocytes (Acton and Knowles,³ Schaarschmidt⁴), but these are not absolutely conclusive. Engel⁵ has discussed the question of punctate basophilia as a sign of latent malaria, but his observations, made in Russia, gave no support to this test. Schilling had asserted it was a reliable sign. Jarno⁶ said that if there is no mononucleosis the case is healed. Acton and Knowles base a diagnosis of latent malaria on leucopenia, or, alternatively, on leucocytosis over 16,000, on general probabilities, and on the presence of urobilin in the urine. Hulse⁷ uses deviation of the neutrophils strongly to the left as a sign. Harrington and Whiteland,⁸ in a study of severe post-malarial anæmia in the Macedonian campaign, also find leucopenia and a slight relative increase of the large mononuclears, but lay much stress on the colour-index and the morphological changes in the red cells. A low index is of better import than a high one, as the latter may indicate a pernicious type of anæmia. Mosse⁹ concurs in this.

2. *Syphilis*.—See the appropriate sections.

3. *Tuberculosis*.—Webb, Gilbert, and Havins¹⁰ found a decided increase of platelets as a sign of latent tuberculosis. Schilling-Torgau¹¹ refers to the fact that the rod-shaped nuclear neutrophils are relatively abundant in the blood of latent tuberculosis cases, and that such cells are not degenerate.

4. *Chronic Renal Disease*.—See KIDNEY, FUNCTIONAL EFFICIENCY TESTS.

5. *Malignant Disease*.—This is discussed under the heading of CANCER.

REFERENCES.—¹*Exact Diagnosis of Latent Cancer*, H. K. Lewis & Co. Ltd., 1919; ²*Veröffentl. a. d. Geb. d. Mil. San. Wes.*, Berlin, 1918, Heft 70; ³*Ind. Med. Research*, 1913, July, 187; ⁴*Beit. z. Arch. f. Schiffe u. Tropenhyg.* xvi; ⁵*Deut. med. Woch.* 1918, No. 15; ⁶*Wien. klin. Woch.* 1917, No. 29; ⁷*Berl. klin. Woch.* 1917, No. 41; ⁸*Glasgow Med. Jour.* 1918, June; ⁹*Berl. klin. Woch.* 1917, No. 36; ¹⁰*Arch. Int. Med.* xiv, 743; ¹¹*Fol. Hæm.* xv, 36.

LATHYRISM.

Herbert French, M.D., F.R.C.P.

Lathyrism is a malady which, though commoner in India than elsewhere perhaps, has occurred in France, Italy, Algeria, and other countries, and is due to the continued eating of certain kinds of peas, notably various kinds of *Lathyrus*, from which the name of the disease is derived. It affects animals as well as man: horses, elephants, sheep, cattle, pigs, and monkeys. A collected and instructive account, both of the disease itself and of experiments on monkeys in connection with it, has been published by Ralph Stockman.¹

Three species of lathyrus may be responsible for epidemic and endemic poisoning in man and animals. (1) *L. sativus*—cultivated lathyrus or chickling vetch—was originally indigenous from the Caspian Sea to the North of India, and spread thence to Southern Europe, where it has long been cultivated as well as in India. In India the peas are of two sizes, the larger of which are grown on dry wheat lands, when they are called *lakh*, and the smaller on wet rice lands, when they are known as *lakhori*. There is said to be no botanical difference, but the latter is reputed locally to be harmless, while the former is considered dangerous. The peas are eaten and the plant is used as fodder in several countries. (2) *L. cicera*—cicer-like or flat-podded lathyrus, or dwarf chickling vetch—is grown chiefly in France, Italy, and Algeria. (3) *L. clymenum*—Spanish vetch—is grown chiefly in Algeria, the Levant, North Africa, and Spain.

Riga pea or 'dog-tooth' pea is the seed of a variety of *L. sativus* cultivated in Russia. The peas are two or three times as large as those grown in India, are wedge-shaped, white, and shiny, with a distinct resemblance to dogs' teeth. Vilmorin gives it the name *dent-de-brebis* or 'sheep's tooth'. The Indian pea, besides being smaller, is greyish or brownish in colour. The Riga pea has the same poisonous action on horses as the others.

The correct Hindustani name for the pea of *L. sativus* is khasari (kessaree), but they are also known in Bengal as teora, and in Sind, the Punjab, and North-West Provinces as mattar. There are many other vernacular names. The Calcutta trade name is khasari, but in the Calcutta market the grains of the garden pea (*Pisum sativum*) and of the field pea (*P. arvense*) are known as mutter (mutter, mattar), while in Bombay and Kurrachee, from which ports the lathyrus peas are shipped to Europe, this word is used in a general sense for peas of different sorts. In consequence the term 'mutter' has been adopted in Great Britain as the trade name for the lathyrus peas, while the seeds of *P. sativum* and *P. arvense* are known as 'Indian peas'. These generally contain from 20 to 30, or even 40 per cent of mutters. In India, khasari is used for food chiefly in three ways—as flour in bread, as porridge, and as a dal (a general term for all kinds of split peas), the peas being cooked with oil or boiled in water. The *L. cicera* is grown chiefly as fodder for cattle in Europe, but in times of dear wheat the peasants use the flour of the seeds to make bread. In France it is known as gesse or jarosse, and in Italy as cecerchia. Most French writers state that the Kabyles in North Africa use the pea-meal of the *L. cicera* and *L. clymenum*, either in the form of thin cakes, with one-third to two-thirds of wheat or barley flour, or as a stew (known as couscoussou) with small pieces

PLATE XXIII.

LATHYRISM



- 1 and 2, Able to walk with one stick in one hand.
- 3, 4, 5, 6, Able to walk with a long stick held by both hands.
- 7 and 8, Able to walk with a long stick held in each hand.

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of meat. They also steep the whole peas in salt water and boil them in a pan. Djlben is the Arab name for the *L. cicera* peas, and djlben-el-hanech for those of *L. chymenum*.

The composition of lathyrus peas as regards protein, fat, and carbohydrate content does not differ materially from that of other peas. They are much cheaper, however, as they grow on poor soil and with little or no cultivation. Hence they come to be largely used by the poor in times of famine, and it has always been in such times that epidemics of lathyrism have occurred.

As regards the illness as it presents itself in man, the symptoms vary greatly according to the amount of the offending peas that are eaten, and the length of time this dietary has had to be continued. Slighter cases show merely a certain degree of motor paresis in the legs, quickly recovered from if the diet is changed. In more severe cases the paresis is permanent, and may involve not only the legs, but also the nerves of the bladder, rectum, and genital organs. Walking becomes difficult and laborious, the patient dragging his legs and feet with a peculiar gait, or he may be unable to walk altogether. Sometimes sensory disturbances are present. The patellar and ankle tendon reflexes are increased. Paresis may be preceded by pain, pricking, numbness, or cramps, but sometimes the motor phenomena may supervene almost suddenly; the arms are involved very rarely. The general health of the patient remains good, and the paresis or paralysis does not appear to be associated with danger to life. Men are affected to a very much greater extent than women, and apparently the disease does not appear unless the lathyrus diet has been persisted in and unvaried for from six to eight weeks. There are considerable variations in the degree of toxicity of the grain used and in the individual susceptibility. *Plate XXIII* shows different degrees of the affection of the legs.

The gait is not always the same, there being differences in type. The mild case, as described by Buchanan,² has to raise his body high before the toes will leave the ground, and the up-and-down movement of the shoulders is the chief symptom noticed. The more severe cases used one stick or two sticks, and these sticks are always long. One stick is put forward, and then the upper part of the body sways forward with it. The body becomes erect before the other stick is put forward, and dragging of the toes in the forward movement of the foot is very marked. The inner side of the nail of the great toe gets worn away, and in bad cases the dorsal surface of the outer toes may be rubbed; over and above this there is nearly always a tendency to cross-legged progression (scissor gait). In another type, during progression the body weight is thrown perpendicularly, first on one lower extremity and then on the other, causing a waddling rolling gait; and when the patient attempts to stand still, one foot is planted below the centre of the axis of the trunk, whilst the other is either advanced, retracted, abducted, or crossed over the supporting limb so as to maintain the balance. When the paralysis is more complete, the patient can progress only on crutches, the lower extremities being dragged forward with the toes scraping the ground. In the most advanced stage of the disease the patient can only move about in a sitting posture, the upper extremities being used as a pair of supports on which the patient is swung forward.

Post-mortem evidence of the nature of the nerve lesion is too scanty to be reliable, but many observers believe the condition to be due to degeneration of both the posterior and the lateral columns of the cord, allied to ataxic paraplegia. Once established, the disease appears to be incurable; but recovery from the incipient stages is possible, the treatment being in the main an avoidance of the offending peas in the dietary and a return to more varied and ordinary foodstuffs.

REFERENCES.—¹*Edin. Med. Jour.* 1917, Nov., 277; ²*Jour. Trop. Med.* 1899, i, 261.

LEISHMANIASIS. (*See KALA-AZAR.*)**LEPROSY.***Sir Leonard Rogers, M.D., F.R.S.*

L. Perrin and G. Brac¹ record the importation of a number of cases of leprosy into Marseilles, due to the war, among combatants or travellers from the colonies, and describe the characters by which they may be detected, with a view to their being exported again.

TREATMENT.—M. Carthew² records details, with some illustrations, of cases of leprosy treated by him in Siam with **Gynocardate of Soda** intravenously and by the mouth during eight months, and later by **Gynocardate of Soda A** (the higher melting-point preparation). He found the duration of the disease did not affect the results, and that the almost universal improvement of the symptoms of the disease and of the general health of the patients indicated the use of gynocardate of soda A in all cases of leprosy of whatever type or duration; and that although it is too early to state definitely that the treatment is specific and curative, the results already obtained strongly indicate that happy result. L. Rogers and J. C. Mukherjee,³ in a lengthy paper, record a year and a half of further experience of sodium gynocardate A intravenously, and a shorter trial of **Sodium Morrhuate** (prepared on similar lines from cod-liver oil), which has also given some promising results in tuberculosis. A further series of 14 cases treated with sodium gynocardate A for from two to fourteen months gave 1 slightly improved, 6 much improved, and 7 lesions disappeared. The after-results are reported of a former series of 26 cases, of which only 16 could be followed up, including 2 who died of intercurrent diseases. Of the remaining 14, 5 remained well for over a year, and 2 for shorter periods, 2 were greatly improved, 1 slightly improved, 1 not improved, while 3 had relapsed; these are regarded as encouraging results considering the advanced stage of most of the cases. The later histories of three cases in which very severe reactions took place are given, one of whom had since much improved, and two very severe cases showed remarkable improvement, indicating that reactions accompanied by great destruction of the bacilli were ultimately favourable. Lastly, 14 cases treated by **Sodium Morrhuate**, either subcutaneously or intravenously, are given, with a coloured plate, showing great and rapid improvement after the simple and almost painless subcutaneous use of the drug. This series showed, in from four to twelve months' treatment (only three cases having been treated for over six months), 2 slightly improved, 9 much improved, and 3 lesions disappeared. Favourable reactions often followed the subcutaneous injection of sodium morrhuate, which is not the case with the much more painful and slowly absorbed gynocardate, so the new drug will allow of the treatment being much more widely used. It also demonstrates that there is nothing absolutely specific about the gynocardates in leprosy, and thus opens up a wide field for investigation. This last point is confirmed by a report by K. K. Chatterji⁴ of two cases of leprosy greatly benefited by injections of **Margosates**, made from nim oil in accordance with Rogers' method of preparing gynocardates.

E. Muir⁵ gives a supplementary report on the treatment of the 30 lepers recorded in the *Indian Medical Gazette*, of June, 1918 (*see MEDICAL ANNUAL*, 1919, p. 246). In addition, 23 new cases, many on **Sodium Morrhuate**, are recorded. Of the 30 cases first reported on after only three months' treatment, the further results were: died, 3; further improvement, mostly slight, 18; now well, 3; relapsed 1, and severe reactions 3, who were improving again later, and 1 showed a most remarkable disappearance of a nodular leprosy. The cases were nearly all advanced ones in a leper asylum. In several cases the sodium gynocardate A (sodium hydnocarpate) caused destruction of the

veins, and sodium morrhuate had to be given intramuscularly, and was found to produce less rapid improvement in anæsthetic, but equally good effects in nodular, leprosy. The rapid early improvement was followed in several cases by slower, but still steady, progress towards recovery. The anæsthesia cleared up first on the face and trunk, and later on more distal parts of the extremities. Of the 23 new cases, all except one showed improvement, and in most of them it was marked. In 10, sodium gynocardate A was given, in 7 sodium morrhuate, and in the remaining 6 both drugs. In one case the symptoms had all disappeared. He advises the following dosage during the first week: on the first day, sodium gynocardate 0.5 c.c. intravenously, on the third day 0.25 c.c. of both sodium gynocardate A and of sodium morrhuate intravenously, on the fifth day 0.5 c.c. sodium morrhuate intramuscularly. During the second and each subsequent week the doses are increased by 0.5 c.c. up to 5 c.c., as long as no febrile reaction occurs, in which case the dose is halved, and increased again up to 1 c.c. less than the fever-producing dose. The injections should be continued for some months after symptoms have entirely disappeared.

REFERENCES.—¹*Presse Méd.* 1919, Feb., 77; ²*Ind. Med. Gaz.* 1918, Nov., 407; ³*Ibid.* 1919, May, 165; ⁴*Ibid.* 171; ⁵*Ibid.* April, 130.

LEUCOPLAKIA. (See LICHEN PLANUS.)

LICHEN PLANUS.

E. Graham Little, M.D., F.R.C.P.

Chipman,¹ from observation of only eight cases, which he rightly calls a limited study, supports the view that lichen planus may result from systemic toxæmia or bacteriæmia, the origin of which is most often, if not always, in the teeth. He contends that x-ray photographs of the teeth should always be demanded in such cases, and that dental opinion not founded on this basis should be discounted. As a corollary to this view the treatment should include the most radical surgical measures for the removal of dead teeth. The method of election for dealing with such is thus described: Under local anæsthesia the gums and the periosteum may be cut loose and retracted along the entire side of the jaw if this is necessary in order to gain space for operating. If the gums are carefully sutured back in normal position against the teeth, reattachment will take place. Ordinarily it is sufficient to cut a triangular flap with the apex pointing to the gingival margin of the tooth to be removed. This flap is raised and held back. Enough bone is removed with the chisel to give access to the apical region. The tooth may be hooked out sidewise, either before or after the apical exploration and curettement, depending on whether or not the entire root length of the buccal plate has been removed. At the completion of the operation the external periosteum flap is pulled into the opening with a suture.

Lichen Planus of the Mucosa, and Leucoplakia.—Brocq² has a notable article on the differentiation of lichen planus confined to the mucosa of the mouth from leucoplakia proper, and the relations of the latter with syphilis. The article is particularly important for the general practitioner, and should be read in the original. He regards lichen planus of mucosa as not in a true sense a leucoplakia, and relies chiefly on the presence in lichen planus of white striae of the cheek, presenting here and there small nodular swellings in their course. There is often a certain degree of atrophy. The absence of scars, sclerosis, ulceration, or infiltration marks it off from syphilis. Brocq distinguishes the following conditions from leucoplakia, which they simulate: (1) Lichen planus. (2) Exfoliative glossitis with desquamating areas on the tongue; these evolve with much greater rapidity than leucoplakia. (3) A superficial diffuse glossostomatitis, associated with a nervous instability and autointoxication. (4) A

lichenification of the mucosæ, especially of the vulva, the result most often of pruritus. In Brocq's opinion, leucoplakia may result from pure traumatism, a class in which the irritation of smoking plays the most important part. It may be quite independent of syphilis, but is naturally aggravated by that factor. He combats the too prevalent error that leucoplakia is necessarily or even frequently the forerunner of cancer, and lays stress on the type met with, suggesting that if rhagades and induration and especially ulceration are present, the transformation into epithelioma becomes more probable. The existence of syphilis makes the change more likely. If there is any reason to suspect epithelioma, a biopsy should be made and sections examined. In any event smoking should be strictly forbidden. Specific treatment should be instituted on the chance of the lesion being syphilitic; but, on the other hand, if syphilis is probable, treatment should be energetic, and continued until a fair trial has been made of it, when, if the patches are unaltered, it should be discontinued. When all the symptoms have disappeared and the Wassermann remains negative, it is futile to persist with antisyphilitic treatment in the hope of dispersing the patches on the mucosæ.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, Oct. 19; ²*Presse Méd.* 1919, May 22, 277.

LITTLE'S DISEASE.

Frederick Langmead, M.D., F.R.C.P.

TREATMENT.—E. Gasne¹ compares the results of treatment by Section of the Posterior Nerve Roots (Foerster's operation) with those obtained by ordinary orthopædic measures. The root section is effective, only if combined with prolonged orthopædic treatment, which alone also gives good results without the attendant risk. He thinks the operation should be employed only as a last resort when contracture persists in spite of prolonged orthopædic treatment, and that it should be reserved for patients who are extremely contracted, for those in whom immobilization in a good attitude is impossible, or for those with total contracture of the lower limbs in whom, after tenotomy, there is a risk of an inverse position by the action of antagonistic muscles.

[This is the opinion which is now becoming generally held; and if we consider the uselessness of performing the operation for those who have frequent fits or are seriously affected mentally, it is clear that it has only a very limited application.—F. L.]

REFERENCE.—¹*Rev. d'Orthop.*, Paris, 1918, vi, 219, in *Surg. Gyn. and Obst.* 1919, Mar., 239.

LIVER, ABSCESS OF. (See AMOEBIASIS.)

LIVER, FUNCTIONAL EFFICIENCY TESTS.

Oskar C. Gruner, M.D.

Wahl¹ works out a means of determining whether the liver is involved in a case of cancer, or not. The elimination of creatine is noted. However cachectic the patient, the creatine output is negligible as long as the liver is intact. Once metastases occur in it, there is a marked elimination of creatine.

Labbé and Daughin² study the colloidal N in the urine, and find the ratio to the total N much increased when the functional capacity of the liver is falling. Bauer and Spiegel use the bilirubin-content of blood as a means of testing the power of the liver (see BLOOD, CHEMISTRY OF).

REFERENCES.—¹*Arch. d. Med. Exp.* 1918, xxviii, 105-54; ²*Ann. de Méd.*, Paris, 1918, 314.

LOCOMOTOR ATAXIA. (See ATAXIA; HYSTERIA AND ORGANIC AFFECTIONS OF THE NERVOUS SYSTEM.)

LUMBAR PUNCTURE. (*See also HEADACHE.*) *J. Ramsay Hunt, M.D.*

Lumbar Puncture as a Cause of Meningitis.—The importance of lumbar puncture as a factor in the causation of meningitis is emphasized by Wegeforth and Latham.¹ Recent studies on experimental meningitis in the Army Neuro-surgical Laboratory of the Johns Hopkins Medical School have demonstrated that the release of cerebrospinal fluid during certain artificial septicæmias in animals is followed by a localization of the infection within the meninges (Weed, Wegeforth, Ayer, and Felton²). The method employed throughout these investigations consisted in giving the animal an intravenous injection of a suitable dose of an organism whose pathogenicity for the meninges was known to be high. Following this, spinal fluid was withdrawn during the height of the septicæmia, either by lumbar puncture or cistern puncture. Animals subjected to this procedure invariably developed a fatal meningitis. Control animals inoculated intravenously with similar or larger doses of the same organisms, and not subjected to lumbar or cistern puncture, remained normal and showed subsequently no evidences of involvement of the central nervous system. This led naturally to the question of the possible clinical importance of such observations.

CLINICAL OBSERVATIONS.—The object was to ascertain the frequency with which cases of septicæmia were subjected to lumbar puncture for diagnostic purposes, and also to learn, when the fluids resulting from such puncture were negative, what the final outcome of the case would be in respect to the appearance of meningitis. To accomplish this it was necessary to have blood cultures taken synchronously with the puncture or within a few hours of the time when it was performed. Examination of the spinal fluid was made immediately after its withdrawal, and consisted of the routine analysis in respect to character, cell count, differential sugar and globulin content, and cultural manifestations. A smear from a centrifugalized portion of the specimen was always made. The cultures were obtained from the centrifugalized portion also, in addition to which clear specimens were incubated separately. As soon as possible after the analysis the patient was examined in the ward, and the subsequent clinical course observed at frequent intervals. Ninety-three patients were suspected of having meningitis and subjected to lumbar puncture. Of these a positive diagnosis of the disease was made in 38 instances from the spinal fluid obtained at the first puncture. The remaining 55 cases yielded clear fluids containing neither pus nor organisms, but among them there were 6 patients who, at the time of the primary puncture, had positive blood cultures: in 3 of these the organism concerned was the meningococcus, and in 3 the pneumococcus. Five of these patients subsequently developed meningitis, the one not contracting the disease being a case of pneumococcus septicæmia, which eventually went on to recovery.

That meningitis does not always follow if a lumbar puncture is performed during certain septicæmias should not be permitted to cloud the real issue, for, in spite of the exceptions given, there is sufficient evidence, it seems, of both an experimental and clinical nature to indicate the need for greater caution in the performance of an operation which may do harm. To prevent the possible accidental production of meningitis as a result of diagnostic lumbar puncture, it is recommended (1) That careful consideration be given the bacteriological study of the blood before such punctures are attempted; (2) That in acute diseases, in the absence of definite signs of irritation of the central nervous system, lumbar puncture should be avoided unless it is first conclusively shown that the blood-stream is free from infection; (3) That when the clinical symptoms are such as to render a lumbar puncture advisable, minimal quantities of fluid should be withdrawn, sufficient only to permit necessary laboratory tests

to be made; (4) That small-bore needles should be utilized in performing the operation, to prevent subsequent leakage of spinal fluid into the surrounding tissues as much as possible.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1919, Aug., 184; ²*Jour. Amer. Med. Assoc.* 1919, Jan. 18, 190.

LUNG AFFECTIONS. Value of radiography in diagnosis (*see p.* 25).

LUNGS, GANGRENE OF.

Arthur Latham, M.D., F.R.C.P.

Verbizier¹ treated a case of pulmonary gangrene due to influenza by the method of **Artificial Pneumothorax** as recently described by Weil. The cavity resulting from the lesion had been partially drained by the right lower bronchus, but this was insufficient, and the patient's condition became gradually worse. On radioscopic examination the cavity was found to be situated in the pulmonary parenchyma. An attempt was made to stimulate the insufficient drainage by the installation of positive pressure in the pleura according to Forlanini's method for pulmonary tuberculosis. This induction of pneumothorax gave a very satisfactory result; by compressing the pocket, it rapidly expelled its contents and led to the approximation of the walls and rapid cicatrization.

REFERENCE.—¹*Bull. et Mém. Soc. Méd. d. Hôp. de Paris*, 1918, xlii, 1139.

LUPUS. Brass preparations for (*see p.* 5).

MALAR BONE, FRACTURE OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Depressed fractures of the malar bone are so commonly seen after the resulting deformity has been perpetuated by consolidation, that it is worth recalling a simple method of correcting the depression in a recent fracture described by A. E. Rockey.¹ Under gas anaesthesia the points of a towel forceps are made to dimple the skin of the cheek so as to grasp the upper and lower edges of the displaced fragment, which is then raised into position. As a rule, the fragment when raised remains in place. The cheek should then be protected from external pressure. In addition to the deformity caused by the neglect of treatment, the infraorbital division of the trigeminal nerve may be compressed and injured, for the fracture line usually runs through the infraorbital groove and foramen. Apart from cosmetic reasons, immediate reduction of the deformity is therefore important.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, Jan. 4.

MALARIA. (*See also* BLACKWATER FEVER.) *Sir Leonard Rogers, M.D., F.R.S.*

PREVALENCE.—The importance of malaria, especially in the Near Eastern War area, has once more led to an immense output of literature on the subject, only the more important of which can be briefly summarized. All writers are agreed that the benign tertian form greatly predominates in the Balkans, and that it is very difficult to cure completely once it has reached the chronic relapsing stage, so it is most important to treat the primary attack with full and long-continued doses of **Quinine**, the one drug really specific against the disease. The occurrence of malaria contracted in England has been dealt with in a series of publications of the Local Government Board,¹ who report the Isles of Sheppey and Grain, Sandwich, Romney Marsh, and Borden and Longmoor in the Aldershot area, as 'malarious-suspected', areas in which special precautions were taken against the spread of the disease, which they do not regard as alarming. P. Chatenoud² similarly deals with indigenous malaria in North-Eastern France, where twelve departments are affected with a mild form of benign tertian malaria. Roubaud³ has proved experimentally that

the anopheles in the Yonne district and around Paris are very susceptible to malarial infection, but does not think the endemic malarial zones in France are likely to increase. H. N. van de Heyden and Schuffner¹ publish an elaborate report on malaria in Sumatra, and advise keeping the ground-water level as low as possible as a preventive measure in an affected sea-shore district.

A. S. Gubb⁵ records the accidental transmission of malaria during a transfusion of blood. Marguerite White⁶ deals with malaria from the surgeon's standpoint. Many cases of pseudo-appendicitis cleared up under intramuscular quinine, while in this affection, as well as in pseudo-cholecystitis, a leucopenia with low polynuclear count is present. Post-operative attacks of malarial fever may be prevented by a prophylactic intramuscular injection of 15 gr. of Quinine, the night before the operation. They only occur in cases treated insufficiently. Ether is the safest anæsthetic in malarial subjects, and chloroform is contra-indicated.

PREVENTION.—The prevention of malaria in rice-growing areas in the Southern United States is dealt with by J. C. Geiger and W. C. Purdy,⁷ who found anopheles breeding as freely as culicidæ in rice-fields, and travelling over a mile from their breeding-grounds. They experimented with various methods of destroying the larvæ in the rice-fields, and found the most satisfactory application to be sawdust saturated with fuel oil and two-plus-one oil, which becomes much more uniformly distributed than the oil itself. The addition of minnows to the water was also useful.

DIAGNOSIS.—J. G. Thomson⁸ has investigated a new complement-deviation test, using cultures of malarial parasites as the antigen, and obtained positive results, but complicated by the necessity of excluding syphilis, which also reacts. H. Aime and J. Lochelongue⁹ also obtained positive Wassermann reactions in eight cases of active malaria, which should be excluded before a positive reaction is taken as evidence of syphilis. V. Schilling¹⁰ finds a well-marked mononuclear leucocyte increase and basophil red corpuscles so characteristic of malaria as to enable all cases to be detected by a blood examination in the absence of parasites due to quinine treatment. Tejera¹¹ records having found malarial parasites in blood taken a few minutes after the birth of two infants whose mothers had recently suffered from severe malaria, which was thus inherited.

J. G. Thomson and C. H. Mills¹² have re-investigated the influence of malaria on the Wassermann reaction, and conclude that if properly performed it does not give a positive reaction in any stage of malaria, not even when numerous parasites are present in the blood.

MORBID ANATOMY.—L. S. Dudgeon and C. Clarke¹³ have investigated a series of fatal malarial cases in Macedonia, and describe in detail the pathological lesions met with. They lay special stress on fatty degeneration of the heart muscle and diffuse tubal degeneration of the epithelium of the convoluted tubes of the kidneys, the latter having been found in 42 out of 46 fatal cases.

COMPLICATIONS.—J. Kirk¹⁴ deals with eye diseases in malaria, which he thinks acts indirectly by causing degeneration of the central nerve elements, producing atrophic keratitis, neuroretinitis, paresis of the extrinsic muscles of the eye, and disturbance of the sensory nerve supply. E. Jeanselme and R. Dalimier¹⁵ have carefully studied the blood-pressure during malarial paroxysms, and found little systolic change, indicating no material effect on the heart muscle; but the diastolic pressure rose 30 to 50 mm. in the cold stage, and fell greatly, even to zero, during the hot stage, to rise again gradually during sweating.

PROPHYLAXIS.—The controversy regarding the value of Quinine in the prophylaxis of malaria continues unabated. G. W. Scott¹⁶ found no material difference in the incidence of malaria in two classes of workers, one with and

the other without prophylactic quinine, on a rubber estate in the Malay States—where, however, the endemic index is so high that this measure would have little chance, as pointed out by the writer. (See MEDICAL ANNUAL, 1919, p. 251.) W. C. Espach¹⁷ also records only slight benefit from this measure in a Mexican river. On the other hand, Castellani¹⁸ advised 8 to 10 gr. of quinine daily as a prophylactic in the Balkans, together with mosquito protection as far as practicable. Seyfarth,¹⁹ working in Bulgaria, suggests as a new form of prophylaxis the regular issue of quinine, combined with fortnightly examinations of the blood the day before quinine is given, to detect early any infections and allow of their being treated effectively before the infection has greatly developed. In many cases severe illnesses were thus prevented. Secchi²⁰ noted that a regiment from a non-malarious district suffered much more than one with previous exposure to malaria, on going to a highly malarious zone. F. G. Haughwout²¹ deals with endemic malaria in the Philippines as a military problem. Recruiting men in such a malarious country involves the inclusion of carriers, unless they are carefully weeded out by expert examination, including concentration and cultural methods, supplemented by provocative methods to detect the parasites. J. C. Geiger, W. C. Purdy, and R. E. Tarbett²² publish a further paper on malaria in a rice district in which a military camp was located and successfully protected against malaria. In an extensive experiment on mosquito flight (*A. quadrimaculatus*), they recorded a flight of one mile. Ten grains of quinine daily for thirty days sufficed to sterilize the blood of malarial carriers.

TREATMENT.—J. W. W. Stephens and his colleagues²³ have continued their laborious quest for a curative treatment of chronic relapsing malaria, and record a second series of 89 cases treated with 90 gr. of Quinine Sulphate on two consecutive days, with a minimum of 94 per cent of relapses against 38 per cent in the first series; and, after excluding other possible factors in explanation of the remarkable difference in the two results, conclude that it was due to the different periods of the year in which the treatments were administered: the higher the mean temperature, the higher the percentage of cures.²⁴ They conclude²⁵ that a given quantity of quinine is more effective if divided into two doses on two consecutive days, than into six equal doses given on six days running. Quinotoxin hydrochloride²⁶ in 5- to 10-gr. doses on two consecutive days had practically no effect in malaria, being greatly inferior to quinine sulphate. J. P. Cardamatis,²⁷ with many years' experience in Greece, claims to radically cure 98 per cent of all forms of malaria by the following method, which proved the best of eight tried by him. He begins with 1.6 grm. in two doses with half-an-hour's interval in the sweating stage, followed by 1.5 grm. daily for eleven days eight hours before the attack. After four days' suspension of treatment, 1 grm. is given daily each evening for eight days, and after another week the same dose is given on the sixth and seventh days of each week up to two months in benign tertian, and three months in malignant tertian or mixed infections. If it is the malarial season, he continues with preventive doses of from 0.35 to 0.5 grm. The Sanitary Department of the German War Office²⁸ advise 18 gr. of quinine daily in 8-gr. doses up to five days after the last fever, followed by 3 days' treatment and four days' intervals up to five or six weeks. In severe or malignant tertian cases, 30 gr. should be given on the first two or three days, or intramuscular injections, and in cerebral cases intravenously. Ochsner²⁹ believes that 2-gr. doses of quinine sulphate every two hours day and night, with the aid of an alarm clock—as missing once or twice will make it useless—for forty-eight hours, repeated after six days' interval, and then a tonic, is the most effective treatment of malaria. A. M. Wilson³⁰ advises 3-gr. doses every three hours up to a total of

48 gr., followed by iron and arsenic to thirty days. D. G. Marshall³¹ met with only 15 per cent of slight relapses in 750 cases treated with 15-gr. doses of quinine twice a day for three days or until the attack is checked, followed by 20 gr. daily for the first week, 10 for the second, and 5 for the third. W. F. Wicht,³² in East Africa, gave 40 gr. daily for ten days, 30 gr. with 5 min. *Liq. Arsenicalis* the next ten days, 20 gr. with 7½ min. *liq. arsenicalis* for the third ten days, after which the quinine is reduced to 10 gr. daily during a fourth ten days. In chronic malaria he continues with 3 gr. of *Soamin* hypodermically for four consecutive days, repeated if necessary, while the patient is in bed. J. K. L. Sykes³³ gave 20 gr. of quinine daily for the first week; and in the next two weeks, in one series he gave 3 gr. every three hours, and in another series 17½- and 15-gr. single daily doses, and found the latter to be followed by far fewer relapses.

Intramuscular Injections of Quinine are advocated by M. Roche³⁴ in African malignant malaria, which was quickly and completely eradicated by 60. gr. of the bihydrochloride in eight 7½-gr. doses, while 80 per cent of cerebral malaria cases were cured by this method and rectal administration. E. B. Gunson, F. W. Winning, Johnstone, Porter, and Scott,³⁵ found that severe malarial cases may become increasingly cachectic on oral quinine, but improve rapidly, especially in their general condition, on intramuscular administration of the drug in addition—two injections of 20 gr. intramuscularly, and one dose of 20 gr. orally for four successive days, the course being repeated ten days later. L. Rogers³⁶ records experiments showing that *Cinchonine Bihydrochloride* is absorbed much more rapidly and completely when injected intramuscularly than the similar quinine salt, and he advocates the intramuscular injection of the cinchonine salt in the strength of 7½ gr. in 1 c.c., in doses of from 7½ to 10 and 15 gr. daily for four days, to cut short rapidly a malarial attack, to be followed by 10 gr. of quinine sulphate orally daily for several months to prevent relapses. The cinchonine salt was found not to destroy muscle fibres like the quinine ones, and to be much less painful on injection.

Intravenous Injections of Quinine are advocated by P. Carnot and A. de Kerdrel³⁷ in cases resisting prolonged oral administration. They use ampoules of 0.4 grm. *Bihydrochloride of Quinine* and 0.2 grm. *Urethane* in 1 c.c. distilled water, diluted when used in 22 c.c. normal salt solution, injected very slowly in the course of five minutes. F. Roux,³⁸ in Madagascar, has given '*Collobiase de Quinine*' intravenously in malaria, and considers it superior to any other form of treatment. J. C. Clark³⁹ advocates in chronic malaria intravenous injections of *Quinine Dihydrochloride* and *Cacodylate of Soda* in doses of 1 gr. of the former for every 10 lb. of body weight, and 1 gr. of the latter for each 50 lb., daily for five days, and then every fifth day for thirty-five days. In addition, 5 gr. of quinine with *Blaud's Pill* are given daily. In 2 only of 32 cases had relapses occurred, and in these re-infection could not be excluded. A. Hay-Michel⁴⁰ advises the intravenous injection of either 0.25 grm. of *Galyi* or 0.3 grm. of *Kharsivan* intravenously, in malaria, in addition to quinine by the mouth.

J. W. W. Stephens and his co-workers,⁴¹ in a further series of studies of malignant tertian malaria, found that two intramuscular injections of quinine bihydrochloride were always followed by relapse within eight to twenty-three days, while 30 gr. of the sulphate on two consecutive days of each week for five weeks prevented relapses in the great majority, and also produced a steady diminution of the crescents, which also disappeared as a rule within three weeks under 30 to 45 gr. per day of the drug. They have also tried arsenic, and found that neither novarsenobillon nor 30 min. per day of liquor arsenicalis had any beneficial effect, either alone or in combination with quinine. C. C. Bass,⁴² as

a result of the study of the treatment of 25,000 malarial cases in the Southern States, advises 10 gr. of Quinine Sulphate daily at bedtime for eight weeks in adults. In acute cases 10 gr. should first be given three times a day for three or four days. By this means 90 per cent will be disinfected, while over three months' treatment is required to cure the remaining 10 per cent. Intravenous injections are only very rarely required in pernicious malaria, and intramuscular injection is very rarely advisable, and should first be tried by the physician himself before he uses it on his patients, when it will seldom be used. On the other hand, they found⁴³ that in benign tertian malaria a combination of Novarsenobillon and Quinine proved more effective than either alone. They also tried arsenic in benign tertian malaria, with inconclusive results. The relapses after any form of quinine treatment in this form mostly (60.6 per cent) took place within twenty days of cessation of treatment, and 26.4 per cent more in the next twenty days, after which they rapidly declined.

Ronald Ross⁴⁴ records that twenty battalions of malaria-infected troops were transferred to France from Salonica, and, after ten weeks' strict quinine treatment with regulated exercise, subsequently did distinguished work in the firing line. Large numbers of malaria-infected troops from England were also able to fight efficiently while taking 10-gr. doses of quinine daily under supervision.

A. Patrick⁴⁵ records an extensive trial of Intravenous Quinine and Tartar Emetic in 104 cases of chronic relapsing malaria. Three injections of quinine bihydrochloride, followed by five of tartar emetic, produced freedom from attacks for three months and over in 55 per cent of resistant benign tertian malaria, but was less effective in the spring. Intravenous quinine quickly stopped attacks, but had little effect in preventing relapses. Intravenous antimony gradually destroyed the parasites and had an effect in preventing relapses, and also in causing crescents to disappear from the blood. One case had crescents in his blood for forty-six days before the antimony injections, but only once three days later after the injections. He advises a further trial of antimony for longer periods, and thinks it has sometimes been too precipitately regarded as a failure.

REFERENCES.—¹*Lancet*, 1918, ii, 151; ²*Thèse de Paris*, 1917-18, No. 136; ³*Ann. de l'Inst. Pasteur*, 1918, No. 32, 430; ⁴*Jour. Amer. Med. Assoc.* 1918, ii, 1524; ⁵*Brit. Med. Jour.* 1919, ii, 74; ⁶*Lancet*, 1919, ii, 154; ⁷*Ibid.* 1919, March 15, 774; ⁸*Brit. Med. Jour.* 1919, ii, 628; ⁹*Bull. et Mém. Soc. Méd. d. Hôp. de Paris*, 1918, xlii, 968; ¹⁰*Deut. med. Woch.* 1918, xlv, 1184; ¹¹*Jour. Amer. Med. Assoc.* 1919, i, 764; ¹²*Lancet*, 1919, i, 782; ¹³*Quart. Jour. Med.* 1919, July, 372a; ¹⁴*Brit. Med. Jour.* 1918, ii, 110; ¹⁵*Presse Méd.* 1918, Nov. 25, 599; ¹⁶*Brit. Med. Jour.* 1918, ii, 463; ¹⁷*U.S. Navy Med. Bull.* 1918, July, 457; ¹⁸*Arch. Méd. Belges*, 1918, lxxi, 145; ¹⁹*Munch. med. Woch.* 1918, lxxv, 1241; ²⁰*Riforma Med.* 1918, xxxiv, 466; ²¹*Philippine Jour. Sci.* 1919, Nov., 287; ²²*Jour. Amer. Med. Assoc.* 1919, i, 844; ²³*Amer. Trop. Med. and Parasit.* 1918, July, 71; ²⁴*Ibid.* Oct., 201; ²⁵*Ibid.* 1919, Feb., 303; ²⁶*Ibid.* 1918, Oct., 217; ²⁷*Jour. Amer. Med. Assoc.* 1919, i, 615; ²⁸*Deut. Mil.-Arzt.* 1918, xlvii, 161; ²⁹*N.Y. Med. Jour.* 1918, ii, 1129; ³⁰*S. Afric. Med. Jour.* 1919, March 8, 73; ³¹*Lancet*, 1918, ii, 417; ³²*Dublin Jour. Jour.* 1918, May, 288; ³³*Pract.* 1918, Dec., 346; ³⁴*Jour. Trop. Med. and Hyg.* 1918, Aug. 15, 165; ³⁵*Lancet*, 1918, i, 866; ³⁶*Brit. Med. Jour.* 1918, ii, 459; ³⁷*War Med. Surg. and Hyg.* 1918, June-July, 590; ³⁸*Presse Méd.* 1918, June 27, 333; ³⁹*Therap. Gaz.* 1918, July, 457; ⁴⁰*S. Afric. Med. Rec.* 1918, Sept. 28, 275; ⁴¹*Ann. Trop. Med. and Parasit.* 1919, May 12, 63-83; ⁴²*Jour. Amer. Med. Assoc.* 1919, i, 1218; ⁴³*Ann. Trop. Med. and Parasit.* 1919, July, 101, 119, and 125; ⁴⁴*Lancet*, 1919, i, 780; ⁴⁵*Jour. R.A.M.C.*, 1919, June.

MALTA FEVER.

Sir Leonard Rogers, M.D., F.R.S.

W. Byam¹ records a case of Malta fever apparently contracted in England. The injection of stock *M. melitensis* Vaccine proved effective in the treatment. L. T. Burra² records having obtained agglutination of both the *M. melitensis* and *V. cholerae* with the blood of six Malta-fever cases. Camacho³ records that

PLATE XXIV.

CHEMICAL TREATMENT OF BREAST CANCER



Fig. 4.—Medullary carcinoma treated by the chemical operation.

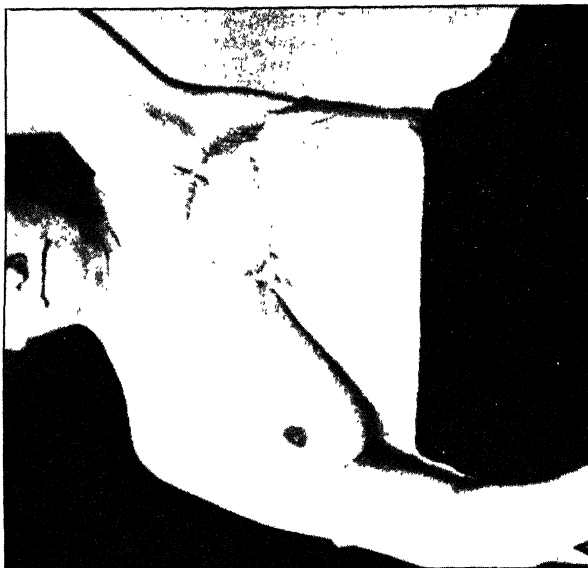


Fig. 2.—Two years and eight months after the operation.

Reproduced from the 'Medical Record'

Malta fever is endemic in Granada, where inflammatory and suppurative processes in joints and long bones are a very common complication, especially in children.

REFERENCES.—¹*Lancet*, 1918, i, 873; ²*Ibid.* 1919, i, 64; ³*Jour. Amer. Med. Assoc.* 1918, ii, 1948.

MAMMARY GLAND, SURGERY OF. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

Strobell¹ advocates **Chemical Extirpation** in inoperable cancer of the breast. He describes seven cases, four of them in women over 60. In all but two, in which the duration of the disease is not stated, the cancer had been present for over two years. He believes that the intrinsic value of the method lies in the severe inflammatory reaction, ending in fibrosis, which follows the application of caustics to the tissues. Morphine-hyoscine narcosis was used. The skin was first painted with pure phenol over the required area. Caustic potash was then used to destroy the skin and superficial fascia, leaving exposed the large fat-lobules connected with the mammary gland. In one case this procedure occupied forty-five minutes. No ether was employed. The twilight sleep rendered the denudation painless. On the following days zinc chloride was painted on the denuded surface, no analgesic being needed. A devitalized plaque was removed daily until the pectoral muscle was reached upon the sixth day. The muscle surface also received one coat of zinc chloride. Axillary glands, too, were destroyed by treating with the chloride. The raw surface left after the separation of sloughs was then skin-grafted. His cases included scirrhus and medullary carcinomata. Three of the latter cases were alive over two years after operation. (*See Plate XXIV*).

G. Labat² describes a method of securing *local anæsthesia of the breast* for complete resection :—

1. An area bounded by the clavicle, sternum, 10th cartilage and rib, and the posterior axillary line, is mapped out by intradermic injection of 0.5 per cent novocain (with adrenalin).

2. The brachial plexus is blocked with 2 per cent novocain. The mid-point of the clavicle is marked where the subclavian artery dips behind the clavicle. The pulp of the finger locates the artery. The needle is then passed along the nail, first aiming at the 2nd dorsal spine, the needle, without the syringe, being inserted to the depth of about 5 cm. The patient indicates the moment of contact with the plexus by starting with pain. When she does this, and not until then, 10 c.c. of 2 per cent novocain solution are injected. Puncture of the pleura or a vessel does not signify. The needle is then withdrawn about 1 cm., its shank is depressed to touch the clavicle, its point is aimed at the anterior tubercle of the 6th cervical vertebra, and it is pushed 1.5 cm. in this direction; another 5 c.c. of solution are injected. The needle is now directed almost vertically to touch the first rib as close as possible to the subclavian artery, and a third injection of 5 c.c. is made.

3. The subcutaneous tissues are anæsthetized with 0.5 per cent novocain by infiltrating the zone already demarcated by the intradermic injection.

4. The intercostal nerves are blocked, the upper two by infiltrating the axilla along its inner wall, with the arm abducted (keeping the larger vessels safe under a finger); the lower nerves are reached by causing the needle to pass up 0.5 cm. under the lower borders of each rib in the posterior axillary line; 2 c.c. of a 1 per cent novocain solution are used for each nerve.

Labat claims less shock, less hæmorrhage, and fewer complications, as the advantages of this method. [Even with general anæsthesia the shock is remarkably slight if ordinary precautions are taken to keep the denuded area warm with towels wet with hot saline.—W. I. de C. W.]

REFERENCES.—¹*Med. Rec.* 1918, Sept, 21; ²*Presse Méd.* Jan. 9, 16.

MASTOID DISEASE. (*See EAR DISEASE.*)**MEASLES.** (*See also PUBLIC HEALTH SECTION.*) *J. D. Rolleston, M.D.*

EPIDEMIOLOGY.—In an article on the periodicity of measles, which he has been investigating during the last five years, Brownlee¹ states that analysis of the statistics for London from 1838 to the present day showed that the main period of measles in London was 97 weeks, but other periods were found, viz., 87 weeks, 89 weeks, 105½ weeks, 109½ weeks, and 114 weeks. The 97 weeks' period existed in all parts of London, but was especially marked in the West End. The 87 weeks' period, on the other hand, was found solely to the south of the Thames. The epidemic of 97 weeks' period showed no evidence of spreading from one district to another, but broke out at the same time in all the districts of London. On the other hand, the epidemic of 87 weeks' period started in one parish and spread to the neighbouring ones. In provincial England and Scotland, the 97 weeks' period was represented by a period of from 97 to 98 weeks in Edinburgh, Glasgow, Birmingham, and Bristol. In Glasgow there was a very marked period of 107 weeks, which was also present in Edinburgh and Birmingham, and absent from Bristol. There was also in Glasgow a small 88 or 89 weeks' period, and in Birmingham this was represented probably by an 86 weeks' period. In Liverpool the main epidemic had a 92 weeks' period, with a subsidiary epidemic every 100 weeks. In Salford there was a period of 92 weeks, with a subsidiary period of two years. In Manchester the periods were not so well marked, but resembled those of Salford rather than those of Liverpool. Bristol showed, as well as a 98 weeks' period, a period of 114 to 115 weeks. The phenomena of London were thus reproduced in the provinces, the periods being essentially the same; the variation was not more than that found in the great London period of 97 weeks. The two-yearly period was not shown in the big English towns except Manchester, Salford, and Sheffield. It was absent from London and the rest of the great towns. In Scotland it existed at present in Aberdeen and Paisley. Brownlee regards the persistence of periods as an important phenomenon. If due to a special strain of organism, the period may die out and be replaced by some other.

BACTERIOLOGY.—L. Hektoen² states that the chief bacteria of importance in measles are: (1) The diplococcus found by Tunnicliff early in the attack in the mouth and throat (*see MEDICAL ANNUAL*, 1919, p. 255); (2) Influenza bacilli; (3) Hæmolytic streptococci. As opsonins and probably other bodies specific for the Tunnicliff diplococcus invade the blood in measles, this coccus must be of some significance. Hæmolytic streptococci predominate overwhelmingly in bronchopneumonia and other allied acute processes in measles, and influenza bacilli are found very frequently in the throat secretions and lung lesions.

ETIOLOGY.—According to Hektoen,³ the results of human experiments show that the cause of measles is present in the nasal secretions, scrapings of the skin, and the blood during the earlier part of the eruptive stage. Attempts to produce by inoculation a mild, modified, or localized form of measles have not yet given conclusive results. The only animal proved susceptible to measles so far is the monkey, but the susceptibility is not marked, and seems subject to variation. The disease in the monkey is mild, and takes the form, after an incubation period of several days, of a brief fever, with which may be associated more or less typical skin changes, respiratory symptoms, Koplik's spots, and the typical measles leucopenia. The results in monkeys show that the cause of measles is present in the nasopharyngeal secretions and the blood at least twenty-four hours before the rash, as well as for a day or two afterwards. That these animals are sometimes insusceptible to inoculation is shown by A. W.

Sellards and J. A. Wentworth,⁴ who inoculated three monkeys intraperitoneally with defibrinated blood taken early in the disease from moderately severe cases of measles. The animals remained entirely free from any symptoms of measles, although two of them were infected a second time.

SYMPTOMS.—D'Oelsnitz⁵ confirms the diagnostic value of the cupping-glass test described by Godlewski (*see* MEDICAL ANNUAL, 1919, p. 255). It enables a more or less early recognition of measles to be made, either by revealing or accentuating the morphological character of an ill-developed or doubtful eruption, or by producing a pre-eruptive erythema. The test is of value in distinguishing measles from rubella and morbilliform eruptions of intestinal origin.

F. Tweddell⁶ reports a case of toxic *meningitis* following measles in a nervous boy, 4½ years old, who had had a mild attack of infantile paralysis, from which he had completely recovered nine months previously. Three weeks after the onset of measles he developed symptoms of meningitis; 30 c.c. of clear cerebrospinal fluid were removed under pressure, and a month later the boy's enlarged tonsils and adenoids were removed, when another 20 c.c. of clear cerebrospinal fluid were withdrawn under fair pressure. The fluid contained increased albumin, 41 cells per field, and did not reduce Fehling's solution. Complete recovery took place five months later. [As no organisms were present in the fluid, the case seems rather to have been one of meningism in a neuropathic subject than of actual meningitis. The enlarged tonsils and adenoids were also probably responsible for the meningeal irritation.—J. D. R.]

Although described by Chauffard and Lemoine in 1895, by Sevestre and Le Clerc in 1896, and by Vergely in 1898, *relapses* in measles are rare. Desbouis⁷ records an epidemic of 30 cases of measles which occurred at Mursansk among the refugees from the interior, and was remarkable for the fact that in 7 cases relapses occurred at dates ranging from sixteen to twenty-seven days after the disappearance of the first eruption. Desbouis thinks that a concomitant infection could be excluded, as in all the cases oculonasal catarrh, which is almost always absent in rubella, was present in both eruptions.

Unlike Levy and Alexander (*see* MEDICAL ANNUAL, 1919, p. 256), who found that streptococcus carriers were specially liable to the complications of measles, Knowlton,⁸ in a series of 458 cases of measles, observed that otitis and pneumonia occurred in the same proportion (10 cases) in the streptococcal and non-streptococcal cases. He concludes that there is no relation between the presence of hæmolytic streptococci in the throat in measles and the occurrence of complications.

According to Richardson and Connor,⁹ very little has been done towards immunization against measles. In 1915, Herrman, of New York, convinced from personal observations that children under five months were immune, inoculated 40 infants aged from two-and-a-half to five months, with nasal mucus taken from otherwise healthy children twenty-four hours before the measles eruption appeared. The mucus was gently rubbed on the nasal mucosa of the 40 infants. Most of them showed no distinct reaction, 15 had a slight rise of temperature, and in a few instances a small number of spots were noticed on the face and body. Subsequently 4 of the 40 (being over one year of age) came in intimate contact with cases of measles, and none contracted the disease. Two of the 40 were reinoculated at the age of twenty-one and twenty-three months respectively, with negative results in each case. Richardson and Connor successfully immunized six children who had been definitely exposed to measles, by intramuscular injection of immune serum derived from convalescents from four to forty days after the appearance of the rash. The dosage ranged from 7 to 25 c.c., usually only a single dose being given. Eight

other children were partially exposed, and did not develop the disease after immunization. Lastly, three children were inoculated simultaneously with immune serum and virus from the nose and throat of measles cases on the first day of the rash. In two there was no reaction, and in the third there was a slight reaction, indicated by a transient rise in temperature and an atypical rash. The writers admit that these experiments are too few to be conclusive, but regard them as sufficiently suggestive to warrant further investigation.

REFERENCES.—¹*Brit. Med. Jour.* 1919, i, 246; ²*Jour. Amer. Med. Assoc.* 1918, ii, 1201; ³*Ibid.* 1919, i, 277; ⁴*Johns Hop. Hosp. Bull.* 1919, 57; ⁵*Presse Méd.* 1919, 268; ⁶*Arch. Pédiat.* 1918, 483; ⁷*Bull. et Mém. Soc. Méd. d. Hôp. de Paris*, 1919, i, 468; ⁸*Jour. Amer. Med. Assoc.* 1919, i, 1524; ⁹*Ibid.* 1919, i, 1046.

MELANODERMIA OF THE FACE.

E. Graham Little, M.D., F.R.C.P.

Schaffer¹ reports a 'war dermatosis' characterized by a desquamation and pigmentation of the face simulating pellagra, and probably caused by toxic food substances. The thickening of the skin may be exaggerated so as to become verrucose. The localization would seem to be determined by light, and consequently limited to the face and neck and, in a less degree, to the hands. Women are more subject than men, and the usual age of patients was from 30 to 45. The disease was intractable to treatment; Olive Oil was the best local remedy.

REFERENCE.—¹*Med. Klin. Berl. u. Wien*, 1918, xiv, 1079 (abstr. in *Med. Supp. Rev. Foreign Press*, 1919, Feb.)

MENINGITIS, POSTERIOR BASIC.

Frederick Langmead, M.D., F.R.C.P.

A. Zingher¹ writes of the value of **Ventricular Puncture** to establish an early diagnosis and for the injection of serum. He recommends this procedure in cases which manifest progressive meningeal symptoms when lumbar puncture fails. In some patients, a few drops of purulent fluid only are obtained by lumbar puncture, but a sufficient amount cannot be withdrawn, even by aspiration with a syringe, and little or no antimeningitis serum can be injected. In others, lumbar puncture yields no result at all. Even less pronounced symptoms, such as slight but definite bulging of the anterior fontanelle, tremors of the extremities, and fever, demand ventricular puncture in cases where lumbar puncture has failed repeatedly in the hands of an experienced operator. Such early punctures are of vital importance in the successful treatment of cases of posterior basic meningitis, for it is essential to establish the diagnosis and inject **Antimeningococcal Serum** early, before more advanced symptoms indicate irreparable cerebral damage. The ventricular puncture should be repeated daily or every other day, 20 to 50 c.c. of fluid being withdrawn on each occasion, and 15 to 30 c.c. of serum injected by gravity. The serum should be warmed to body temperature, and a smaller amount injected than that of the fluid withdrawn. The intervals between the punctures, and their total number, depend upon the rapidity with which the fluid, etc., re-accumulate, as indicated chiefly by the bulging fontanelle, and upon the result of bacteriological culture of the fluid. A **Lumbar Puncture** should be made at the time the patient is discharged from hospital, in order to determine the re-establishment of the communication between the cerebral ventricle and the subdural space of the spinal canal. If the baby is breast-fed, every effort should be made to continue this feeding while it is in hospital. Occasionally the diagnosis may be assisted by a culture of the nasal discharge.

The technique of ventricular puncture is simple, but requires certain precautions. The infant should be wrapped in a sheet and placed in the dorsal position with the head brought near the edge of the table. The area over and around the anterior fontanelle is then shaved, if necessary, and sterilized

by tincture of iodine. One assistant holds the head firmly between his hands, and another secures its body. The operator sits at the head of the table. The lumbar-puncture needle used should not be larger than a No. 18 gauge, 3 in. long, and with a short bevelled point. It is introduced through the anterior fontanelle on a horizontal line connecting the two lateral angles, 1 cm. from the middle line, in order to avoid the longitudinal sinus, and passed to a depth of from 2 to 5 cm., when the lateral ventricle is reached. The direction of the needle is almost perpendicular but slightly outward and forward. The needle is held very gently. After reaching the ventricle, the plunger is removed and the fluid allowed to escape into a test-tube. If it flows too rapidly it may be stopped temporarily by re-introducing the plunger. The serum is injected by attaching to the needle rubber tubing connected with a barrel of a 10 to 20 c.c. syringe containing the serum, and allowing it to run in slowly.

REFERENCE.—¹*Amer. Jour. Med. Sci.* 1919, ii, 58.

MENTAL DEFICIENCY.

Bedford Pierce, M.D., F.R.C.P.
Marguerite Wilson, M.B., Ch.B.

Auden,¹ in discussing modern problems in mental deficiency, says the question may be approached from the compassionate, sociological, eugenic, and educational point of view. He states that it is not possible to define mental deficiency strictly, the condition being so variable. The proper classification of children is of greater practical importance than strict definition. First, defects in intelligence, and secondly, defects in conduct, can usually be distinguished, although both may be combined. He suggests that intellectual capacity may be described as a function of two variables, viz., general intelligence and specific abilities, each of which, independently of the other, may be highly developed, mediocre, or reduced, and precocious, normal, or retarded at the time of emergence. He uses the term *larval* for retardation or delay in the appearance of mental qualities. The main danger to the community arises from the defects of conduct or frequently associated with mental weakness. These children, especially when exhibiting antisocial tendencies, derive little benefit from special schools. He considers it very important that backward children should not necessarily be sent to these schools, and that they should not be used for the school failures, as many of these are not really mentally defective. He advocates the formation of classes for retarded children separate from the schools for defectives, and considers in practice they can be distinguished one from the other. In a large school system he suggests four series of classes: (1) for the clever and specially intelligent, (2) for the average, (3) for the backward and retarded, (4) for the defective. The proper differentiation of these groups of children is a matter requiring much special knowledge, and more efficient training of the school medical officer is urged.

Laing Gooden² discusses some of the so-called '*stigmata of degeneration*'. He questions the reliability of these signs, as there is no reliable information regarding their presence in the ordinary mentally healthy population. The duplex eye (pigment in the anterior layer of the iris in rings, spots, or all over) he has found to be much more common among neurasthenic soldiers than the simplex eye (pigment totally confined to the posterior layer of the iris). He raises the question whether this would not be the same in the general population, i.e., the duplex eye is the common type. He is also not convinced that the high narrow arched palate is a stigma, and suggests that it may be a British characteristic.

Swanberg and Haynes³ have investigated the presence of *menstrual disturbances* in the feeble-minded and defectives. They find that at least 20 per cent have definite pathological menstrual disturbances. Amongst the disturbances,

irregularity, menorrhagia, and dysmenorrhœa are commonest. It would not have been suspicious had the percentage been a much higher one, as judging from usual experience the figure must be at least as high in the general population.

TREATMENT.—McCready¹ considers that with possibly a few exceptions all mental defectives are capable of improvement. **Hygienic Measures** such as regular hours, good food, fresh air, and exercise are followed by marked improvement. He considers it necessary to start educating the defective at a very early age. Treatment ought to be begun as soon as the condition is recognized. It is unnecessary to wait until the child is old enough to have 'stereotyped tests' applied. The physical condition must be seriously considered, and every effort made to improve it. In the infant, maternal nursing is desirable, but should be discontinued if conditions are unfavourable. Artificial feeding may be needed to supply the vitamins, etc., which in some cases are absent from the maternal milk. Sajous is quoted as recommending the administration during pregnancy of organic products when there is any reason to suspect that the child might be defective, owing to bad heredity or other cause. The administration may be continued during lactation with advantage. The child should spend a minimum of time indoors. **Hot Baths, Cold Packs, Cold Douche, Cold Shower, and Cold Sponging** are all useful in stimulating nerve tone, but must be given judiciously. **Sun Baths** are highly recommended, and ought to be continued until tanning occurs. The special dangers of heliotherapy must be guarded against. **Massage** and, later, **Corrective Exercises** are useful.

A careful physical examination is of the greatest importance, and all sources of reflex irritation, such as adenoids, enlarged tonsils, eyestrain, phimosis, carious impacted teeth or dental abscesses, impacted cerumen, etc., treated and removed.

Antisymphilitic treatment should be given when necessary, and continued, even when no improvement is observed, until the disease is eradicated and further degeneration prevented.

The use of **Atropine** in full doses is highly recommended by McCready in "the active, restless, and neurotic type of defective. In apathetic, listless individuals, **Nux Vomica** in ascending doses till full physiological tolerance is reached is of great value." **Mercury, Iodine, and Arsenic** are of use in some cases, but must be administered very cautiously. Their use may be followed by depression, weakness, and irritation.

Great attention should be paid to the condition of the ductless glands. "The adjusting mechanisms of development are more or less reciprocal; thus, a ductless gland not only influences development, but is itself influenced by changes in general development." Probably the thyroid plays the leading rôle in supplying the stimulus for bodily metabolism. The thymus, general lymphatic system, and perhaps the pineal, act as a check upon it during childhood. These also delay sexual activity. The adrenal system in due course stimulates the sexual organs and also promotes muscular and skeletal growth. At this stage the pituitary is of great importance, as it stimulates every organ of the body. **Organotherapy** is not a specific in mental deficiency, and those who expect miracles from its use will be disappointed. The deficiency is usually polyglandular. McCready gets the best results when a combination of the various glandular extracts is administered. He gives small doses of pituitary, thymus, thyroid, and adrenal glands, with, in male children, the addition of testicular substance, and, in the female, ovarian and mammary substances.

REFERENCES.—¹Proceedings of Conference on Mental Deficiency, Central Association for Mental Deficiency, 1919, Nov.; ²*Lancet*, 1919, July 5; ³*Jour. Nervous and Mental Dis.* 1919, 1, No. 3; ⁴*Med. Rec.* 1918, Nov. 9.

MENTAL DISEASES. (*See also* DEMENTIA PRÆCOX; GENERAL PARALYSIS; MENTAL DEFICIENCY; PSYCHOTHERAPEUTICS.) { *Bedford Pierce, M.D., F.R.C.P.*
 { *Marguerite Wilson, M.B., Ch.B.*

ETIOLOGY.—There is little fresh to record respecting the causation of mental disorders. The old divergences of opinion remain, and it is difficult for the unprejudiced reader to harmonize the conflicting theories. There is happily an increasing tendency to consider both the psychogenic and the physical factors important, and to discourage dogmatism. The recent teachings of one school are reviewed in the article on PSYCHOTHERAPY (p. 289). To an increasing extent it is recognized that the primitive instincts play an important part in producing morbid symptoms, and in the psychoneuroses especially it is now generally accepted that repressed desires, conflicts, and fears are essential factors in their causation. There is still much uncertainty about the part these conflicts take in the production of the psychoses, even though it be admitted that they colour the symptoms and provide the details of the clinical picture.

The difficulty lies not so much in tracing the symptoms back to their mental antecedents, as in explaining how it happens that the individual reacts in the peculiar way which we call a psychosis. It is not unlikely that more than one cause may produce a similar train of mental symptoms in the same individual. If this be so, the study of the mental make-up goes but a small way to explain why the individual is ill. Another school of thought lays great stress on toxæmia, and two articles on this subject are referred to later. A third school blames the ductless glands and the internal secretions, and in the present limited state of our knowledge of the endocrine organs it is not easy to controvert this view. As a consequence there is much empirical treatment with glandular extracts, and the results, except in hypothyroidism, are disappointing.

Heredity.—Myersen¹ has investigated insanity in families with regard to the type of insanity which may be expected in descendants. The results may be tabulated as follows: (1) Paranoid type of psychosis (true paranoia, paranoid dementia præcox) results in either paranoia or dementia præcox in insane descendants. (2) Dementia præcox results in dementia præcox, feeble-mindedness (? early dementia præcox), or epilepsy. (3) Manic-depressive insanity results in either manic-depressive insanity or dementia præcox. (4) Involution psychosis results in dementia præcox. (5) Senile psychosis results in dementia præcox, manic-depressive insanity, paranoid group, imbecility, or epilepsy.

Toxæmia.—Attention is drawn to the importance of *focal infection* in causing insanity by a series of cases published by Henry A Cotton.² The cases presented clinical features of delirium and delirious mania, and either before or after death multiple foci of infection were found, yielding *Str. viridans*, *Str. hemolyticus*, or a Gram-negative diplococcus with which the name Connellan-King is associated. It is stated that the true nature of the disease could not have been ascertained but for careful bacteriological examination. Cotton lays great stress on dental infection, and considers it imperative to remove all doubtful teeth. Especially he urges the routine practice of x-ray examination before assuming that the teeth are sound. He freely criticizes the common practice of crowning devitalized teeth, and the conservative dentistry which retains teeth that appear sound upon external examination. He says, "Hardly a patient of the better class is admitted to the Hospital at Trenton who has not had expensive gold crown and bridge work, and our first act is to tear it all out, for by experience we know that it is infected". He considers decayed teeth less serious than capped teeth, as infection at the root is very common, and there is no outlet but through the bone and the lymphatic system. He

maintains that much of this infection is painless, does not lead to pus formation or fever, and it may be long before any distant foci of infection appear. The diagnosis of this condition is not easy. The extent of the disease will always be found to be greater than appears in the skiagram; and if the gums are not perfectly healthy-looking, i.e., pink and firm, the teeth should be extracted. He says, "So we have made it a practice, after many unpleasant experiences caused by being too conservative, to extract every tooth that is at all doubtful". He considers the primary source of infection occurs in the teeth, and it may be communicated from one person to another—for instance, from parent to child in kissing—and he suggests that this fact may lead to modifications of current views of the hereditary nature of mental disorders. Secondary infections occur in the tonsils and in the gastro-intestinal and genito-urinary tracts, and the original source may be altogether overlooked. Cotton considers thorough and routine examination of every patient by modern bacteriological methods is necessary. In particular the examination of the blood is of the first importance. Besides the Wassermann test, he employs complement-fixation tests for the organisms responsible for local infections. Also cultures are made from the roots of extracted teeth, tonsils, or nasal, vaginal, or other discharges. This in addition to the usual examination of the cerebrospinal fluid, and the Abderhalden tests for internal secretions. From a clinical point of view, the fixation test for the *Str. viridans* or the diplococcus (Connellan-King) is of great value. He admits the difficulty of establishing the relationship of these organisms to remote pathological changes, and has found this test was frequently the only clue to a true diagnosis. It is clear, however, that further investigation is needed before the far-reaching conclusions of the author can be accepted.

Ford Robertson³ discusses the etiology of *neurasthenia*, and enumerates the symptoms—amongst others: constant feeling of fatigue not relieved by rest, hyperæsthesia, paræsthesia, localized pain, exaggeration of patellar reflex, tremor of eyelids when half closed, incoercible ideas, obsessions, and phobias. He states that *neurasthenia* may be the prelude to serious organic disease such as general paralysis or dementia præcox, or physical disease such as pernicious anæmia. He considers that trauma, physical or mental, has been much over-estimated as a cause. He believes that the condition is due to chronic bacterial infections, and that trauma is only the last straw. He investigated 66 cases of *neurasthenia*, and in all some chronic bacterial infection was present. Amongst the organisms found were pneumococcus, *Str. pyogenes*, *Str. faecalis*, and organisms of the diphtheroid group. The last he considers to be vastly the most important. They have been found present in dementia præcox, exophthalmic goitre, and *neurasthenia*. In *neurasthenia* the urine is often loaded with these organisms. The chief seats of infection are intestines, nasopharynx, gums, and urinary tract. He reports recovery of many cases under therapeutic measures such as vaccines.

Before accepting the conclusions reached by these two authors, it is desirable to know the extent to which similar organisms are present in healthy people taken at random. It would be important to know whether the roots of healthy teeth are always sterile, and whether bacilluria may not exist in persons who may justly claim to be in good health. Moreover, what evidence is there that the bacteria found had anything to do with the nervous symptoms presented?

The Influenzal Psychoses—Menninger⁴ has found that, apart from the febrile deliria, there is an interval of from two to eight days between the termination of the influenza and the onset of the psychosis. Delirium may occur before, with, or after the fever. Depression he finds to be rare. Delusions and

hallucinations are the commonest symptoms. He remarks the frequency of the onset of dementia præcox. Other writers find that dementia præcox is rare except when symptoms have been previously present. Influenza has been found to be an exciting factor in precipitating general paralysis. Many writers are convinced that there is always some latent predisposition. All seem to agree that the type of influenza has nothing to do with the resulting psychosis. Various classifications have been made. Kirby⁶ suggests: (1) Post-febrile neurotic states of fatigue and depression; (2) Deliria (infective exhaustive psychoses); (3) Constitutional psychosis, such as manic-depressive insanity. Weber⁴ notes delirious states with motor agitation and hallucinations. These developed within four to ten days, and he says the prognosis is good.

The experience of one of us has been much less fortunate. A large number of cases were under treatment, presenting marked motor agitation, very vivid hallucinations of sight, and fleeting terrifying delusions. In some cases there were also both auditory and olfactory hallucinations. The associated type of influenza varied. Bronchopneumonia was present in many of the cases, but the severity of the symptoms was out of all proportion to the physical signs found. No instance of recovery is recalled.

Insanity and the Ductless Glands.—Phillips⁷ notes the frequency of enlargement of the thyroid gland in asylum populations, especially among females. At the Bel Air Asylum, Geneva, 36 per cent of patients of both sexes were found affected, while at the recruiting station for the same canton only 5 per cent were found goitrous. At St. Andrew's, Northampton, 12 per cent of patients had enlarged thyroids. He quotes Marzocchi and Antonini as follows: "The goitrous, including congenital cases, are eight times more susceptible to insanity than those not affected with thyroid enlargement". In hypothyroidism quite small doses of thyroid are recommended, also careful search for and elimination of any foci of toxic absorption. In hyperthyroidism he recommends calcium lactate in doses of 10 gr. three times daily. He sounds a warning note as regards x-ray treatment and operation, which he has found at times to be not only useless but harmful.

Citelli and Calicete⁸ have described the 'Citelli psychic syndrome' in persons with adenoids or other affections of nose or sphenoid sinus: mental backwardness, poor memory, tendency to drowsiness or insomnia, inability to concentrate. They ascribe this to disturbance and injury of the pituitary gland by the presence of the adenoids, and emphasize the importance of the early treatment of these conditions.

Beverly Tucker⁹ agrees with Cushing that pituitary secretion contains a substance which has to do with stability of cortical cells, and that in the absence or diminution of the secretion convulsions might occur. He divides hypopituitarism into two classes: (1) Chronic or congenital: marked by increased fat, lack of body hair, diminished perspiration, scanty menstruation in females, bradycardia, lowered blood-pressure, small genitalia, with or without convulsions at adolescence. (2) Transitional: secretion lessens during adolescence, sometimes traceable to illness or trauma: lack of perspiration, increase in fat, increased sugar tolerance with craving for sweets, with or without convulsions. Mental symptoms may be marked. He recommends administration of the whole substance of the pituitary gland. In America the fresh gland is given in capsules.

Senile Insanity.—That loss of memory in the aged does not necessarily involve loss of testamentary capacity is the opinion expressed by Sir George Savage¹⁰ in a delightful lecture on mental disorders associated with old age. A case is given in which recent memory was entirely lost but clear intentions were expressed regarding the disposal of a certain piece of property, and the

opinion was given that the patient could give valid instructions for its disposal. In another case, however, a will was made with Savage's approval, although it contained provisions which appeared unjust to certain relatives. The attention of the testator was expressly drawn to these questions at the time, but he would not alter them. Some weeks later he complained that he had been allowed to make an unjust will, and it transpired that he had entirely forgotten the previous interview. In the same lecture the mental symptoms of old age are reviewed—the loss of control, the restlessness, the decay of moral control leading to many painful cases of improper and indecent conduct, emotional weakness, and, in particular, actual depression; it is pointed out that suicide is very common in the aged, and is frequently due to delusions of poverty or impending disgrace. Finally, hallucinations of both smell and sight sometimes occur. Savage considers the prognosis of a first attack of mental disorder at 60 is better than at 16, it being assumed that the man who has lived safely through the stresses of life will probably have more reserve strength than the youth.

In a leading article in the *Lancet*,¹¹ the *death-rate among asylum patients* is severely criticized. The figures and facts are taken from the Commissioners' report. The death-rate, calculated on the daily average population, amounted in 1918 to 19.56 per cent, compared with 16.86 per cent in 1917 and 9.43 per cent in the pre-war year. This great increase was confined to institutions receiving pauper patients. A special committee was appointed by the Board of Control to investigate, and reported that the main cause was reduction in quantity and deterioration in quality of the foodstuffs supplied to the patients. The Commissioners, on the findings of the Committee, made a series of recommendations to the asylum authorities. The deficiency seems to have been mostly in the amount of the 'fat-soluble-A' vitamine. This is present only in certain fats of animal origin and green leaves. It is present in greatest quantity in butter, cream, cod-liver oil, beef fat or suet, fish oil (cod-liver oil), liver, kidney, heart, milk, whole raw eggs, cabbage, lettuce, spinach, salmon, and herring, and in very small quantities in cheese, wheat, whole rice, and other foods. It is only present in margarine when made from certain animal oils. It will be noted that the above-mentioned articles are not ones which figure prominently in the average menu of public institutions.

TREATMENT.—Kempf¹² makes sweeping assertions respecting the evils of asylum care. He claims that after eight years of intensive analytical study of many hundreds of patients of both sexes of every intellectual level and of every nationality, he is "forced to the conclusion that all the extreme conditions of dementia not caused by organic destruction, and all the cases of chronic sexual perversion, are due for the most part to the close long-continued confinement and seclusion in wards". He further states that a careful study of over 2000 cases shows that the mental derangement and weird thoughts are greatly influenced by, if not mostly constituted of, sexual fancies and cravings, and that when such patients are confined they are placed in a situation directly contrary to the laws of nature. His remedy is the cultivation of **Vigorous Games** at all times of the year—drilling, boxing, wrestling—and that all athletic sports should be cultivated under experienced trainers. In addition, he recommends all kinds of **Vocational Training**, arts, crafts, engineering, horticulture, stock-raising, and all kinds of trades, and that patients should be paid for their work and be encouraged to sell their products. He pictures a radical change in hospital régime, requiring a great increase of staff, additional physicians, nurses, and vocational and athletic trainers, and he claims the additional expense would be worth while, as he states that probably 80 per cent of the mentally afflicted could be cured if properly treated!

Graves¹³ recommends the use of **Calcium Lactate** in excited states (mania, epilepsy, agitated melancholia, recent acute hallucinations) in 10-gr. doses three times daily. He states that the beneficial action is observed in twenty-four hours, marked by abatement of excitement, alleviation of acute mental symptoms, without production of stupor. The younger the case, he finds, the better the result.

Trials of calcium lactate have given disappointing results in our own practice, but the patients were over 40 years of age.

Devereux¹⁴ strongly recommends **Luminal** and **Luminal-Sodium** in disturbed and excited cases. The drug must be used cautiously and the effects watched. Given three times daily he found stupor and dizziness resulted. In epilepsy 1½ gr. luminal or 2 gr. luminal-sodium are given at night, and in this disease it is said to have acted almost as a specific, inhibiting the seizures. Luminal is readily soluble, and may be given hypodermically. It is an excellent hypnotic, and given with care no bad results have been noticed. Unfortunately it is almost unobtainable in both America and Great Britain.

Taylor¹⁵ recommends the giving of **Paraldehyde** hypodermically into the pectoral muscles. No local reaction follows. He quotes a case of very intense excitement asleep in ten minutes after a large dose of 2 dr. given in this way, all other hypnotics having failed.

There is, however, an increasing consensus of opinion that sedatives are of little value in the treatment of mental disease and are frequently hurtful. The subject was discussed in the Presidential address to the Medico-psychological Association (see *Journal of Mental Science*, Oct., 1919).

REFERENCES.—¹*Jour. Nervous and Mental Dis.*; ²*N.Y. Med. Jour.* 1919, March 8, 397; ³*Jour. Mental Sci.* 1919, Jan.; ⁴*Jour. Nervous and Mental Dis.* 1919, Oct., 404; ⁵*Ibid.* June; ⁶*Ibid.* Oct., 405; ⁷*Jour. Mental Sci.* 1919, Oct.; ⁸*Ibid.*; ⁹*Arch. Neurol. and Psychiat.*; ¹⁰*Lancet*, 1919, i, 1013; ¹¹*Ibid.*, Sept. 20; ¹²*N.Y. Med. Jour.* 1919, July 5, 8; ¹³*Brit. Med. Jour.* 1919, April 5; ¹⁴*Jour. Nervous and Mental Dis.* 1919, Aug.; ¹⁵*Lancet*, 1919, Nov. 1.

MIGRAINE.

J. Ramsay Hunt, M.D.

Headaches of migrainous origin are of such common occurrence that any suggestions as to treatment are most welcome. Paquiez, Vallery-Radot, and Nast,¹ of the Bicêtre Hospital, recommend the administration of **Peptone** before each meal. The dose is 0.5 grm., administered in cachet one hour before eating. A number of cases are reported in which this simple and harmless procedure produced a prompt amelioration of the severity of the attacks, and even a complete cessation for considerable periods of time. This treatment is based on the idea that certain types of migraine are produced by an anaphylactic reaction to protein; there are cases which are usually benefited by a purely **Vegetable Diet**. In a study of the giant urticaria and its relation to anaphylaxis, the authors conceived the idea of giving a minimum dose of the toxic albumin one hour before the ingestion of a larger quantity, the result being an absence of the usual urticaria. Recognizing the anaphylactic nature of certain migraines and their dependence upon a hypersensitization to certain proteins, they conceived the idea of applying the same principles of preventive treatment. For this purpose peptone was used in small quantities a sufficient time before the ingestion of food to counteract any anaphylactic consequences.

REFERENCE.—¹*Presse Méd.* 1919, April 3, 172.

MOLLUSCUM CONTAGIOSUM.

E. Graham Little, M.D., F.R.C.P.

Wile and Kingerley¹ report some very interesting experiments and results by which they claim that they have demonstrated that it is possible to convey experimental molluscum contagiosum by inoculation of molluscum material

obtained from a clinical case, and subjected to filtration through a fine Berkefeld filter. Two patients were tested. In the first the typical tumours developed in from fourteen to sixteen days. In the second patient the development was much delayed, no quite typical lesions forming for something like six weeks; in both cases microscopic examination established the character of the experimental growths. (*See also* EPITHELIOMA ADENOIDES CYSTICUM.)

REFERENCE.—¹*Forty-second Annual Meeting of Amer. Dermatol. Assoc.* 1919, June.

MORBILLI. (*See* MEASLES.)

MOUTH, CANCER OF.

Sir W. I. de C. Wheeler, F.R.C.S.I.

W. L. Clarke¹ finds that **Electrothermic Methods** are peculiarly adapted to the treatment of cancer within the mouth. Malignant tissue (including bone) occurring in any part of the oral cavity, comprising the lips, buccal surface, tongue, floor of the mouth, alveolus, hard palate, antrum, tonsils, pharynx, epiglottis, larynx, and proximal end of the œsophagus, may be destroyed with one electrothermic operation. A tongue may be coagulated to the base and then excised without hæmorrhage. The heat penetrates beyond the area totally destroyed, and devitalizes malignant cells without impairing healthy tissue, thus lessening the likelihood of local recurrence or metastasis, and conserving the maximal amount of normal tissue. Two methods are employed: (1) The desiccation method, by means of which malignant growths of small or moderate size may be destroyed by the utilization of heat of just sufficient intensity to desiccate or dehydrate the tissues. It is produced by a monopolar high-frequency current of the Oudin type, which is applied to the lesion by means usually of steel knitting-needles, which may be cut and curved, if necessary, to suit the case under treatment. The method is of advantage when the lesion is localized and a good cosmetic result is desired, and can be so accurately controlled that a very small growth even on the cornea may be successfully treated without injury to vision, and a growth on the vocal cords may be destroyed without impairing phonation. The very slight trauma and absence of secondary inflammation probably explain the absence of scarring and the success obtained in treating delicate structures. (2) Electrocoagulation, produced by a bipolar high-frequency current of the d'Arsonval type. It is more penetrating and intense in action than the desiccation method, and is utilized to destroy large growths, including those that involve bone.

The heat from high-frequency currents, unlike that from the thermocautery and galvanocautery, is not transmitted by contact, but is generated within the tissues by the resistance offered to the current. The cautery is comparatively superficial in action, while the high-frequency current under proper conditions will penetrate and destroy tissue to any depth, in parallel or divergent lines, depending on the size and arrangement of the electrodes, and also the strength and quality of current, which are varied to suit indications. When the tumour is covered by normal tissue, it must be exposed by dissection. When involved cervical glands are to be removed, excision must be practised, because it would be dangerous to work with the current near vital structures in the neck.

Clarke gives a summary of 200 cases treated by these methods, aided by x rays, radium, and the knife. In 70 cases of lip cancer without metastasis, there was no recurrence within a period of from six months to four years. Of 13 cases of the alveolus and hard palate 5 gave recurrences. In a total of 149 cases of mouth cancer with growths distinctly localized, 36 recurred. Of 51 cases where the cervical glands were invaded but movable, the disease recurred within four years in 42 patients.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1918, Oct. 26, 1365.

MUMPS.

J. D. Rolleston, M.D.

Symptoms.—Radin¹ describes an epidemic of mumps at Camp Wheeler, where between October, 1917, and March, 1918, there were 5756 cases among approximately 18,000 men, an incidence of 32 per cent. Forty-seven patients gave a previous history of mumps, in the majority of which cases the gland on the opposite side had been involved, but three patients had the same gland involved twice. One patient was supposed to have had mumps three times. The intervals between the attacks in these cases varied from two weeks to fourteen years. Relapses occurred in 6 cases, the interval being from two to three weeks. Radin attaches considerable importance to what he calls *Hathcock's sign*, which is present before any swelling can be detected. It consists in tenderness just beyond the angle of the jaw on running the finger towards the angle under the mandible. The following complications were observed: Of 4397 cases, 611, or 13.91 per cent, had testicular involvement (orchitis, epididymitis, or epididymo-orchitis on one or both sides). It is noteworthy that this complication did not occur more frequently in patients who got up for meals and walked about than in those who stayed in bed. Suppurative otitis media occurred in 20 cases, or 0.45 per cent. Pancreatitis, characterized by intense nausea and anorexia, pain and tenderness in the epigastrium, and occasionally by jaundice and diarrhoea, occurred in 14 cases, or in 0.31 per cent. There were 5 cases of lobar pneumonia, 1 of bronchopneumonia, 9 of bronchitis. The only death was due to pneumonia.

Haden² records 9 cases of *cerebral complications* occurring among 476 soldiers suffering from mumps. The patients exhibited a fairly uniform symptom-complex. Usually, as the parotitis was subsiding, there was a marked rise in temperature with little change in pulse-rate, severe headache, nausea, and vomiting. Orchitis was often present. On examination, the patient was dull, answered questions slowly, showed slight stiffness of the neck, Kernig's sign, and variable reflexes. On lumbar puncture the fluid was clear, with a lymphocytosis and increased pressure. Smears and cultures were negative except in one case, where Gram-positive cocci were found, but animal inoculations and cultures were negative. Lumbar puncture proved an efficient therapeutic agent. Haden regards the condition as due to encephalitis rather than meningitis, though his reasons for doing so are not obvious.

Pujol³ reports 3 cases of *myocarditis* in soldiers as a sequel to mumps, in which every other etiological factor could be excluded. In 2 of the cases the attack of mumps was severe, and was complicated by nephritis and orchitis respectively; in 1 the attack was mild. The physical signs were reduced to a minimum. Apart from a variable degree of tachycardia, nothing abnormal was found on examination of the heart, and the blood-pressure was normal or almost normal. In none of the cases was the heart found to be enlarged on x-ray examination. Functional tests, however, revealed a marked cardiac insufficiency. The prognosis was good on the whole, but bad as regards the patient's future, as the condition was incompatible with heavy work.

TREATMENT.—Radin¹ found that Hexamethylenamine, in doses of gr. v, four times daily, had some value in reducing the incidence of orchitis.

REFERENCES.—¹*Arch. Internal Med.* 1918, ii, 354; ²*Ibid.* 1919, i, 737; ³*Med. Supp. Rev. Foreign Press*, 1919, 27.

NASAL ACCESSORY SINUSES.

{ P. Watson-Williams, M.D.

{ A. J. Wright, M.B., F.R.C.S.

The Blood-clot Dressing in Frontal-sinus Surgery.—Davis,¹ as a result of its success in operations on the mastoid process, was induced to try the Blood-clot Dressing after an external frontal-sinus operation. The operation was performed for a chronic infection of left frontal-sinus and ethmoidal cells, with

a secondary orbital abscess from a perforation of the sinus wall. The sinus was large, and it was found necessary to remove the orbital arch, and the blood-clot method was employed to obviate extensive deformity. The cavity was filled with iodoform gauze for twenty-four hours, a gauze drain left in for a similar period, and the cavity then allowed to fill with clot. The wound was healed in a week, and when seen three months later the deformity was trivial. The method should be worthy of trial in a similar case.

Orbital Infections from Nasal Sinuses.—Voil² concludes that all cases of orbital abscess secondary to an accessory sinusitis are due to an actual perforation into the orbit from the sinus, not to a venous or lymphatic infection. He bases this view on having found a hole leading from sinus to orbit in all such cases that he has operated on. He has also found that the type of exophthalmos is of assistance in the determination of the sinus involved. With a sphenoidal and posterior ethmoidal sinusitis the eye is pushed straight forwards, with an anterior ethmoidal sinusitis forwards and outwards, and with a frontal sinusitis downwards and slightly forwards.

Tuberculous Sphenoidal Sinuses.—Tuberculosis of the accessory sinuses is rarely recognized. Kernan,³ in describing a case, apparently a primary infection of the sphenoidal sinuses, states that he can find no other record of a primary tuberculosis of this sinus. The case was a female negro, age 31. The symptoms of six months' duration consisted of emaciation, pyrexia, and a severe and constant occipital and retro-ocular pain, but there were no signs of an active pulmonary tuberculosis. Examination showed a polypoid mass in the region of the posterior end of the right middle turbinal, with profuse purulent secretion, and an 'adenoid-like' mass in the nasopharynx. The operation performed showed extensive disease of both sphenoidal sinuses, vomer, palate bone, and pterygoid plates. Histological examination showed the tissue removed to consist of tuberculous granulations. Symptoms were relieved by operation, but the eventual result is unknown.

Latent Sinusitis in relation to Systemic Infections.—It has been generally accepted that nasal accessory sinus infections are a very infrequent cause of systemic septic infections. Watson-Williams⁴ points out that this is the case if gross macroscopic pus is taken as the only evidence of a sinus infection. In his experience, however, a latent sinusitis can exist—viz., a sinus infection which is characterized by the presence of living and virulent micro-organisms in the fluid drawn from the sinus through a sterile cannula, although macroscopically pus is absent. This type of infection is, in his experience, the not infrequent cause of systemic infections, the absence of pus showing a lack of local defensive reaction to the organisms and thus accounting for the general infection. As illustrative examples, two cases of chronic rheumatoid arthritis, which had proved resistant to other treatment, were greatly improved by operation on the sphenoidal sinuses; the washings from the sinuses were free from pus, but on culture showed growths in the one case of *S. albus*, and in the other of *S. aureus* and *Str. brevis*.

REFERENCES.—¹*Laryngoscope*, 1919, Jan., 5; ²*Ibid.* May, 263; ³*Ibid.* 276; ⁴*Jour. Laryngol.* 1919, July, 233.

NASAL CATARRH.

Herbert French, M.D., F.R.C.P.

Vaccine Treatment.—L. Mackey¹ records his personal experiences of the bacteriology of recurrent and chronic nasal catarrhs, and their relief or cure by vaccine treatment; and although vaccines have been employed for so many different conditions and in so reckless a way as to bring them into partial disrepute in the eyes of many doctors, there is a strong opinion developing that they are of real value in the lessening of a personal tendency to suffer from

recurrent catarrhal infections of the nose, throat, or upper and middle respiratory passages. [I personally, having been thoroughly sceptical, am quite persuaded as to their real value, not only for recurrent nasal catarrh, but also for recurrent bronchial inflammation.—H. F.] The vaccine is used not so much for the treatment of an acute attack, as for diminishing the patient's general liability to catarrhal affections of the nose and bronchial tubes, so that he gets fewer recurrences, and these recurrences tend to be very much less severe than previous to the use of the vaccine treatment. Mackey's conclusions are strongly in this direction, and as the result of watching 500 cases treated with autogenous vaccines, he summarizes them judicially as follows :—

In many cases, though the same germ as before may still persist in the nose and tend to a recurrence of the catarrhs after two or three years if the vaccine course is not repeated, the patient, as the result of an immediate course, is pleased and grateful, and regards himself as temporarily cured, at any rate, for he no longer has any subjective sign of the catarrh. In about half the cases the catarrh is cured and the nasal passages contain only the ordinary flora. In about one-third of the cases the catarrh persists in a modified degree. Naturally the great majority of his patients were already more than ordinary sufferers, and considering that this was the type of case dealt with, the results amply justified the treatment. There is even more than this to be said of it, for in the case of a patient with secondary disorders, whether the vaccine cures the catarrh or only reduces it, the general health improves, the patient gains weight and strength, ceases to fear chills and colds, is in better spirits, and loses that which is so common a dread in catarrhal subjects, the fear of tuberculosis.

For the treatment to be successful, however, experience in the collection of the specimen and in the technique employed is of great moment, and Mackey lays particular stress upon the need for starting the cultures directly after the swabs have been taken; for if there is the postal delay of hours before the swabs are inoculated upon the culture media, the resultant cultures may be inappropriate. Pneumococci and *B. influenzae*, which are amongst the most important germs found in recurrent nasal catarrhs, are apt to die out quickly if the swabbings get cold; whilst germs of minor importance, such as staphylococci and diphtheroid bacilli, actually multiply on the mucus on the swabs and become disproportionately abundant if the swab has to be sent through the post before it is inoculated on to the culture media. Thus, in a case where immediate cultures were made, the find might be as follows: pneumococci 1000 colonies, staphylococci 8 colonies; whilst a swab taken at the same time, but sent through the post and cultivated the next morning, might grow: staphylococci 1000 colonies, pneumococci nil. Failures to get benefit from autogenous vaccine often depend upon the vaccine being unrepresentative of the actual germs causing the catarrh owing to this source of fallacy.

Mackey does not advocate post-nasal swabbings, but swabs through the anterior nares, making his nasal swab much like a throat swab, but smaller, and on a fine wire so that it may follow any twisting of the nasal passages without hurting the patient. Having ascertained that the patient has not recently used any antiseptic nasal douche, he passes a nasal swab gently along the floor of the nasal passage until it reaches the back of the nasopharynx, then moves it about a little, and withdraws it in such a way that it rubs against the turbinate bone; having swabbed the other side in the same way, he immediately inoculates two plates of blood agar, places them in the incubator, and thus starts his cultures at once.

The following are the tabulated results showing the micro-organisms found

in 558 cases of chronic nasal catarrh, only good growths on blood agar being tabulated.

	Occurred in	Pure cultures in
Pneumococcus	191 cases	103 cases
<i>B. influenza</i>	142 "	48 "
<i>M. catarrhalis</i>	119 "	49 "
<i>S. aureus</i>	104 "	56 "
Streptococcus (not <i>Str. mucosus</i>)	52 "	18 "
Diphtheroid bacillus (<i>B. septus</i> and <i>B. coryza</i> <i>segmentosus</i>)	46 "	10 "
<i>Str. mucosus</i>	41 "	22 "
Friedländer's bacillus (<i>B. mucosus capsulatus</i>)	41 "	14 "
<i>S. albus</i>	40 "	26 "
<i>M. tetragenus</i>	5 "	5 "
<i>B. proteus</i>	4 "	0 "

351 cases showed pure cultures. 207 cases showed mixed cultures.

The above figures need little comment, but it may be necessary to record the fact that the list does not include either cases of a single attack of 'cold in the head', or epidemics of nasal catarrh such as may occur in a school, the inclusion of which would be misleading if applied to common colds in general.

The vaccine used most frequently was pneumococcal, either pure or combined with some other germ; the next more frequent being Pfeiffer's influenza bacillus; next after which came *M. catarrhalis*, *S. aureus*, *Str. mucosus*, Friedländer's bacillus (*B. mucosus capsulatus*), *B. septus*, and *B. coryza segmentosus*. The vaccines were made in such strengths that 20 minims represented the maximum dose; Mackey thus began with 4 or 5 minims, gradually increasing at successive doses, and giving as a rule twelve altogether at intervals of a week. The maximum dose of pneumococcus and streptococcus used was 150 million for an adult; of the other germs, 300 to 400 million. The vaccines were administered by the patients' own doctors, and there was no report of any difficulty or unpleasant reaction in the course of the treatments.

REFERENCE.—¹*Brit. Med. Jour.* 1919, ii, 159.

NASAL HYDRORRHŒA.

P. Watson-Williams, M.D.

The treatment advocated by Thompson,¹ of Cincinnati, based on his experience of seven cases of this rare disease, is the cautious use of a spray of the following solution:—

R Atropine (alkaloid)	gr. ss	Camphor	gr. xij
Epinephrin	gr. j	Oil of Sweet Almond	ʒij
Menthol	gr. xxiv	Liquid Petrolatum	ʒvj

He directs that the menthol, camphor, epinephrin, and atropine be triturated in a mortar till they liquefy, and then the mixed oil of sweet almonds and petrolatum added very slowly with constant stirring; let the mixture stand twenty-four hours, then filter.

Castex² records a case of nasal hydrorrhœa which had persisted for twelve years and had resisted all topical applications, general treatment, and dietetic and climatic therapeutics. But the patient had a goitre, and treatment with Thyroid preparations produced favourable results on the hydrorrhœa. The best result, however, was obtained later, when, on the diagnosis of a syphilitic infection, a course of antisyphilitic treatment with Mercury and Iodide of Potassium had been carried out; this apparently cured the nasal symptoms.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, Aug. 23, 587; ²*Ibid.* May 31, 1640.

NEPHRITIS. (*See also* KIDNEY, FUNCTIONAL EFFICIENCY TESTS; URINE, ABNORMAL CONSTITUENTS OF.) *John D. Comrie, M.D., F.R.C.P.*

In the consideration of a series of cases of acute nephritis which Atchley¹ studied by the various modern methods applicable to the blood and urine, he enters a plea for the broader study of the chemical balances of the body as a whole in this disease, which he thinks may demonstrate that the kidney is of only secondary importance. The same general idea is advanced by Nathan,² who finds 'Brightisme' an association of pulmonary, digestive, and other diseases perverting general nutrition, and holds that while treatment must be directed in the first place to relieving the phenomena arising from the kidney failure, it is of equal importance to recognize and treat these pre-existing conditions. Hunt,³ as a contribution to the etiology of nephritis, studied 342 cases; of these, 60 showed well-defined evidence of focal infections followed by renal involvement which suggested diffuse hæmatogenous inflammatory lesions or nephritis with fibrosis. Culture studies showed a *Str. mucosus* to be the principal pathogenic organism, and in order of frequency other bacteria were a diphtheroid bacillus, *Bacillus mitis*, *Str. candidus*, *Str. viridans*, and a pneumococcus. Syphilis of an inherited type as a cause of nephritis is discussed by Hutinel,⁴ who finds that in children with nephritis the treatment of an underlying inherited syphilis is often followed by very favourable results. The nephritis does not assume any special type, but this author found that it tended to appear after infectious maladies like purpura or mumps or tuberculosis, or even after some very slight inflammatory condition. Even the inconsiderate use of salt or of protein dietary was liable to bring on recurrence. He does not advocate the use of mercury, which he has found to bring on hæmaturia, but intravenous injection of one of the **Organic Arsenic Compounds** was not followed by the same objectionable result.

The diagnosis of nephritis in children presents some special features, as pointed out by Schippers and De Lange.⁵ As a result of examination of the urine in 1000 children at the Children's Hospital in Amsterdam, they found that the presence of albumin and formed débris is not to be trusted for a definite diagnosis of nephritis, since they may be found in the healthy child. These writers prefer to do a function test by means of potassium iodide, of which 0.5 grm. is given to the child in a wafer; the iodine in normal children has completely ceased to be excreted in the urine by the fortieth hour. They prefer, however, a simple test of the glomerular function which they call the accommodation test. The child drinks a definite amount of water (from 500 to 1500 c.c.), and the glomerulus function is estimated by the time required for this mass of fluid to be eliminated: healthy kidneys get rid of the whole or even of a little more within four hours.

Myers and Killian⁶ have furnished evidence for the belief that the kidneys are rarely able to overcome the handicap of a high creatinine accumulation. Out of 94 cases of nephritis with blood-creatinine values of 5 mgrm. or more per 100 c.c., improvement almost never followed, and speedy death was the usual outcome. On the other hand, patients with high figures for urea, but without marked creatinine retention, generally improved. Hence these investigators came to the conclusion that the creatinine data gave them a better prognostic insight into doubtful cases than did either the blood-urea figures or the phenolsulphonephthalein tests which were made simultaneously. Legueu⁷ emphasizes the necessity for determining the nitrogen of the blood in cases of urinary retention, especially those in which there is a proposal to remove the prostate. The writer refers to a paper on this subject by Widal, Weill, and Vallery-Radot (*see* MEDICAL ANNUAL, 1919, p. 275). Peters⁸ gives a modified formula for the determination of the coefficient according to Ambard's

law, and states that we may always assume that if there is a loss of 20 per cent according to this test of renal function, we are dealing with a pathological case.

The amount of cholesterol in the blood as a prognostic indication has engaged the attention of various workers. Stepp⁹ investigated 47 cases of nephritis of various types with the object of determining this point. The normal percentage of cholesterol in the blood of a systemic vein is, according to Autenrieth-Funk, between 0.14 and 0.16, and according to Henes between 0.11 and 0.18. Stepp found generally, when severe forms of parenchymatous nephritis were present, that the blood-cholesterin was increased, and this applied both to the acute and to the chronic diffuse glomerulo-nephritis. In some cases the cholesterol rose to 0.562, 0.572, and even in one case to 0.8 per cent. It has been said that the excess of cholesterol in the blood is the cause of albuminuric retinitis; but Stepp, having carefully examined the fundus oculi in all his 47 cases, is able to dispose of this theory, since the neuritis and retinitis were by no means found in those cases which showed the highest degree of cholesterolinæmia. Port¹⁰ has also investigated a series of 23 cases of Bright's disease with the same object. He found a great increase of cholesterol in the serum in nephroses, especially in chronic diffuse glomerulo-nephritis. On the other hand, the cases of secondary contracted kidney showed no increase of cholesterol. The last observation goes to show that atheroma is not caused by an excess of cholesterol in the blood, as has been suggested.

TREATMENT.—The treatment of renal dropsy by dietetic means is discussed by Allbutt.¹¹ In a case where diuretics, diaphoretics, laxatives, and the other ordinary means had been tried with only passing benefit, and where after tapping and the removal of 45 pints of fluid the dropsy quickly recurred, recourse was had to more stimulating diet than had been before allowed. The patient received **Lean Meat, Lean Ham, Whites of Eggs, Green Peas, Rice, Fish, Bread, Milk, Tea**, salt in moderation, and fluid as reasonably desired. The patient had been excessively dropsical from March till the beginning of July; then the above diet was commenced, and by the beginning of September the dropsy had entirely disappeared. Allbutt considers that this type of diet is applicable to all cases of œdema with great loss of albumin in the urine and consequent devitalization, as occurs in chronic parenchymatous nephritis. A similar case is recorded by McCay¹² in a Hindu patient who had suffered for several months from anasarca, ascites, and œdema of the lungs, with great albuminuria, dilatation of the heart, etc. He was put on a diet with increasing amounts of protein, and at the same time the carbohydrate was gradually cut down. From the middle of May he was on a **High Protein Diet** following the lines of that recommended by Epstein (*see* MEDICAL ANNUAL, 1919, p. 275), and by the middle of July the anæmia and œdema had disappeared and the albumin was reduced to a mere trace.

The process of **Plasmaphæresis** in the treatment of chronic nephritis and uræmia is discussed by O'Hare, Brittingham, and Drinker,¹³ who practised it eighteen times on eight cases suffering from this condition. The process consists in drawing the blood, when venesection is performed, into sodium citrate solution, centrifugalizing it, washing the corpuscles in 0.85 sodium chloride solution, and returning them, thus deprived of the serum, into the patient's circulation. They suggest, however, that the benefit from plasmaphæresis is only temporary in tiding over a brief period of uræmia when the urine is suppressed.

WAR NEPHRITIS.

An important contribution to the basis of this subject was made by Maclean,¹⁴ who examined the urine of 60,000 men at base dépôts in France and Aldershot. He examined the urine in the morning, so as to avoid transient albuminuria

the result of exercise, etc., and the investigation was carried out during the summer months (May to September, 1917). The total percentage of soldiers with albuminuria (all of whom were supposedly healthy) was 6.48; from this number a deduction was made for cases of albuminuria due to transitory causes like pus, spermatozoa, etc., leaving 5.62 per cent with true renal albuminuria, of whom 2.19 had albumin in gross amount. The urine of those who showed marked albuminuria was examined for tube-casts, and these were found in 1.88 per cent of all men examined. It may be said therefore that 2 per cent of men suffered from unsuspected renal disease. This may fairly be taken as typical of the whole British Army. About one in every twenty of these was traced as having subsequently developed definite nephritis.

A résumé of the symptoms found at the onset of war nephritis in a casualty clearing station is given by Day.¹⁵ In about 40 per cent of cases a period of ill-health lasting some weeks preceded the onset of the nephritis, which almost invariably began with fever; dyspnoea was very common, and signs of bronchitis and other pulmonary troubles appeared early as a rule; pains in the head and limbs, headache, enlargement of the spleen (in 80 per cent of cases), oedema, and blood in the urine if the lower urinary tract was inflamed, casts in plentiful amount, albuminuria, and reduction in the amount of urine, were signs which developed within the course of a few days. Ryle¹⁶ also gives his experiences of nephritis admissions to a casualty clearing station. He found that the season of occurrence was in the months of November, December, January, and February, and that there was a distinct tendency for particular areas or particular bodies of troops to be affected. Pulmonary symptoms were almost always present, and this writer appears inclined to regard the lungs as the primary seat of the malady.

An American experience of war nephritis during the winter of 1918-19 is given by Vander Veer and Saunders.¹⁷ They found a family liability to kidney disease in about one case in four, though all the cases had been free from albuminuria on joining the army; 60 per cent of cases appeared to have been excessive meat eaters; and 27 per cent had had typhoid fever before joining the army; but otherwise there was nothing remarkable in their history. With regard to treatment, patients received a quart of Lemonade on the first and second days after entering hospital, and were Bled from 16 to 20 ounces if the blood-pressure was high or there was marked dyspnoea or oedema.

The Italian view as to the nature of war nephritis is expressed by Lombardo,¹⁸ who considers that it is not to be regarded as a disease *per se*, because both the symptoms and the pathological anatomy show a complete identity with the common glomerulo-nephritis. He attributes the cause to one or other of various infections attacking more readily the renal organs which have been devitalized by fatigue of war, exposure, prevalent meat dietary, intoxication, etc. A similar view of nephritis as it occurred among the French troops is taken by Gouget,¹⁹ who says there is nothing either in the clinical characters or in the development of these nephritis cases to distinguish them sensibly from those which we have been accustomed to observe in time of peace, and one has difficulty in understanding how certain English authors have seen in them a new affection different from that which we recognized before the war. One-third of Gouget's recent cases came on after some definite cause, e.g., typhoid fever, prolonged suppuration of a wound, gonorrhoea, exposure to cold, etc. The same proportion was observed in cases which had begun prior to the onset of the war. According to His,²⁰ war nephritis hardly ever occurred in Turkey, and in his inspection of Turkish military hospitals not one case was found among thousands of sick; the only exception was in the Taurus in the winter of 1915-16, where many cases of malaria developed severe nephritis.

In the German army, Strasser²¹ found a large number (between 400 and 500) of cases in the spring of 1915 after the operations in the Carpathians; one of the main features of these cases was prolonged hæmaturia. In treatment, he depended largely on **Hot Baths** and **Carbohydrate Diet**. Singer²² and Schulz²³ had both found great benefit from **Bleeding** in all cases where the blood-pressure was above 160 mm. of mercury. Toennissen²⁴ found that 78 per cent of cases in the German army occurred among infantry, and that 68 per cent of cases underwent complete recovery, the average duration of illness being four to six months.

REFERENCES.—¹*Arch. Internal Med.* 1918, Sept., 370; ²*Presse Méd.* 1919, March, 143; ³*Jour. Amer. Med. Assoc.* 1919, Feb., 450 (abstr. from *N.Y. State Jour. Med.* 1919, Jan. 4); ⁴*Ibid.* (abstr. from *Paris Méd.* 1919, Jan., 65); ⁵*Ibid.* (abstr. from *Nederl. Tijdschr. v. Geneesk.* 1918, Dec. 23); ⁶*Ibid.* 1919, March, 656; ⁷*Presse Méd.* 1919, March, 141; ⁸*Deut. Archiv f. klin. Med.* 1919, June, 253; ⁹*Ibid.* 1918, Sept., 439; ¹⁰*Ibid.* Bd. 128, Heft 1, 61; ¹¹*Brit. Med. Jour.* 1918, ii, 395; ¹²*Indian Med. Gaz.* 1919, Aug., 297; ¹³*Arch. Internal Med.* 1919, March, 304; ¹⁴*Brit. Med. Jour.* 1919, i, 94; ¹⁵*Lancet*, 1918, Nov., 660; ¹⁶*Med. Rec.* 1919, Aug., 237; ¹⁷*Jour. Amer. Med. Assoc.* 1919, May, 1586; ¹⁸*Policlínico*, 1919, April, 528; ¹⁹*Presse Méd.* 1918, Oct., 553; ²⁰*Berl. klin. Woch.* 1918, 1190; ²¹*Med. Supp. Rev. Foreign Press*, 1918, Dec., 451 (abstr. from *Zeit. f. Phys. u. Diætet. Therap.* 1918, 55); ²²*Ibid.* (abstr. from *Wien. med. Woch.* 1918, 1297); ²³*Ibid.* (abstr. from *Ibid.* 1918, 1149); ²⁴*Deut. Archiv f. klin. Med.* 1919, June, 183.

NERVES, PERIPHERAL.

J. Ramsay Hunt, M.D.

The Paleokinetic and Neokinetic Systems of Peripheral Nerves.—The existence of two distinct physiological systems for the transmission of motor impulses in peripheral nerves is suggested in a recent contribution by Ramsay Hunt.¹ The problem of motility, notwithstanding the many notable contributions of recent years, is far from a final solution. This is true of reflex action, associated movement, hypertonicity after central lesions, and cerebellar function. It is especially true of all that pertains to the extrapyramidal motor pathways. In our conception of motility as it relates to the peripheral nervous system, we think of motor nerves as subserving a single function only, the transmission of motor impulses from the anterior-horn cells of the spinal cord to the skeletal muscles. This is the conception of the final common path as enunciated by Sherrington, in which all varieties of motor impulses converging from the various central pathways are supposed to traverse a single physiological system of peripheral motor neurones. The present study is a consideration of evidence from various sources which would appear to suggest a modification of this view, to the extent of recognizing two great physiological systems for the transmission of motor impulses in peripheral nerves, corresponding to certain cardinal differences in the nature of movements and their relation to special integrative and correlating centres in the central nervous system.

If motility is resolved into its component parts, three fundamental types of movement may be recognized, corresponding to important stages in the phyletic development of the nervous system. There are, for example, reflex movements, which are very primitive and correspond to different levels of the segmental nervous system; there are automatic and associated movements, which are under the control of certain infracortical centres; and there are isolated synergic movements of cortical origin. The isolated synergic movement is the highest type of motility yet produced in the course of evolution of the central nervous system, and finds its most complete expression in man. There must therefore exist in the cerebrospinal axis other groups of fibres subserving the function of motility, and these are now generally recognized as the extrapyramidal motor systems. In this system the rubrospinal tract of Monakow is perhaps the best known and most important, arising in the red nucleus and traversing the entire length of the spinal cord. Abundant evidence

has also been furnished from other sources—clinical, pathological, experimental, and comparative—showing the existence of extrapyramidal motor tracts in the central nervous system; and that these are of especial importance in the lower forms of life where cortical development is rudimentary. In previous studies, Hunt has presented evidence which would appear to indicate that the extrapyramidal motor system is under the control of the corpus striatum, and that a loss of the large motor cells of the corpus striatum in man is associated with the clinical phenomena of paralysis agitans. Paralysis agitans, according to this conception, is produced by a break in the striospinal system of motility, and is the counterpart in the extrapyramidal system of spastic paralysis following lesions of the pyramidal tracts. Typical reflex movements are therefore purely spinal, and the first to appear in the evolution of animal life. Next in order would come the various automatic and associated movements, which would correspond to the development of a primitive correlating mechanism, the corpus striatum. The most recent addition to motility is the isolated synergic movement of cortical origin, which permits of the special dissociations underlying the various skeletal acts which have contributed so largely to the progress of man.

In the present study, evidence is presented which would appear to indicate the existence of a similar physiological division of motor systems in peripheral nerves; one of these is for the transmission of automatic and associated movements, which, because of its age and more primitive function, may be termed the paleokinetic system. The other is for the transmission of isolated synergic movements of cortical origin, and may be distinguished as the neokinetic system. The paleokinetic function represents a more primitive and more diffuse form of movement, which is under the control of the corpus striatum and is subserved by a *strio-spino-neural* system. The neokinetic function is a more highly specialized form of movement, which is under the control of the cerebral cortex and is subserved by a *cortico-spino-neural* system. According to this conception, the skeletal musculature which is the peripheral organ of motility is innervated by two distinct systems of fibres, which are physiologically and anatomically distinct: a paleokinetic system for automatic and associated movement, and a neokinetic system for the isolated synergic movements of cortical origin. With this differentiation in the central and peripheral motor system, which represents two distinct phases in the evolutionary development of motility, there is, he believes, a corresponding differentiation of reflex function, so that it will be possible to recognize certain paleokinetic and neokinetic reflex manifestations referable to one or the other of these two systems.

It is not without interest to recall that Henry Head and his collaborators, in their exhaustive study of the afferent nervous system, have reached somewhat similar conclusions. They find evidence in the peripheral nervous system of the existence of two distinct types of sensibility, a *protopathic* and an *epicritic*. The *protopathic* is a lower order of sensation, in contrast to the *epicritic* sensibility, which finds its interpretation in the cerebral cortex. The diffuse primitive character of the *protopathic* sensibility suggests a certain analogy to the diffuse contractions of automatic and associated movements. On the other hand, the discriminative quality of the *epicritic* sensibility is in the sensory sphere the counterpart of the isolated synergic movement of cortical origin. It is also significant that the optic thalamus, which is the great *infra-cortical* station for *protopathic* sensibility, stands at the same physiological level as the corpus striatum, which, according to Hunt's conception, is the organ for control of automatic and associated movement. There is accordingly a certain harmony in these two conceptions of the afferent and efferent systems.

Pelwo-trochanteric Paralytic Syndrome Following Gluteal Injections.—Sicard and Roger² describe an atrophic paralysis in the gluteal region following the intramuscular injection of mercury, quinine, and other remedies. There is atrophy of the glutei, and an abnormal prominence of the great trochanter and tuber ischii. Pain is generally present during the earlier period in the gluteal region. The muscles below the gluteal fold are not atrophic, and there are no evidences of involvement of the sciatic nerve. The condition is due to injury of the nerves supplying the coxo-femoral muscles—viz., the glutei, pyramidalis, gemelli, and quadratus femoris. The prognosis is not favourable, and in all of the author's cases no improvement had taken place after two years.

Syndromes of the Posterior Cranial Nerves.—The cranial nerves which traverse the foramina of the posterior fossa at the base of the skull have been particularly favoured in the matter of syndromes. This region would almost seem to constitute a seat of election for those who are in pursuit of this form of clinical entity. Among the older syndromes referable to this region may be mentioned those of Avellis, Schmidt, Jackson, and Tapia. These names are all related to the early period of specialization in medicine and the development of laryngology and neurology. *The syndrome of Avellis* is characterized by hemiparalysis of the soft palate and of the larynx, and is referable to a lesion of the pneumogastric and internal branch of the spinal accessory nerve. *The syndrome of Schmidt* is characterized by the addition to the above of paralysis of the sternocleidomastoid and trapezius muscles, which are innervated by the external or accessory branch of the spinal accessory nerve. *The syndrome of Hughlings Jackson* is a combination of the syndrome of Schmidt with hemiparalysis and hemiatrophy of the tongue. This is produced by an involvement of the hypoglossal nerve which is superadded to that of the vagus and spinal accessory nerves. In the *syndrome of Tapia* there is hemiparalysis of the tongue and of the larynx with preservation of the function of the soft palate, the lesion in this case being situated below the level of emergence of the palatine nerves, i.e., below the plexiform ganglion. This may or may not be associated with paralysis of the trapezius and sternocleidomastoid muscles. This rather complicated array of syndromes has been simplified in the following table (Villaret and Faure-Beaulieu³).

	X, XI (Int.) (Vago-spinal)		XI (Ext.)	XII
	Soft palate	Larynx	Sternocleidomastoid and Trapezius	Tongue
Avellis ..	+	+		
Schmidt ..	+	+	+	
Jackson ..	+	+	+	+
Tapia ..		+	Inconstant	+

These authors would add another nerve syndrome to this region referable to lesions in the *posterior retroparotid space*. They base their conclusions upon two cases, both resulting from injury in the mastoid region, with hemiatrophy and paralysis of the tongue and larynx, with taste disturbances (glossopharyngeal nerve), and in addition a paralysis of the cervical sympathetic—with enophthalmos, narrowing of the palpebral fissure, and miosis. The characteristic features are the symptoms referable to the glossopharyngeal and sympathetic nerves.

As a *syndrome of the posterior lacerated foramen*, Vernet⁴ has devoted special attention to the symptomatology resulting from injury of the 9th, 10th, and

11th cranial nerves, which pass through the jugular foramen. These nerves may be invaded by growths at the base of the skull, and injured by gunshot wounds in the region of the mastoid process. The 9th, 10th, and 11th cranial nerves pierce the dura mater close together, and pass through the middle division of the jugular foramen in arithmetical order antero-posteriorly. Immediately in front of the 9th is the inferior petrosal sinus; immediately behind the 11th is the jugular vein at its commencement. Dr. Vernet has shown that the main features of the syndrome consist subjectively of nasal regurgitation of liquids (soft-palate paralysis), difficulty in deglutition of solids (pharyngeal paralysis), and hoarseness (laryngeal paralysis). On the sensory side, taste disorders of the posterior part of the tongue always co-exist with the motor paralysis when the nerve is severely injured, but may be absent in case of superficial injury or slight compression. Involvement of the sensory fibres of the vagus produces a defect of ordinary sensibility in the area of the soft palate, pharynx, larynx, and of the auricular branch of the vagus—viz., a small area round the external auditory meatus (when the nerve is irritated there is hyperæsthesia or actual neuralgia in the same regions). Disorders of salivation, consisting of dryness of the mouth, or, if the nerve is irritated, hypersecretion of saliva, may occur; also coughing fits, not unlike pertussis, in irritation cases; respiratory disturbance in the form chiefly of exertion-dyspnoea, or, in inhibition cases, dyspnoea of a pseudo-asthmatic type; pulmonary disorders in the form of recurring congestions.

REFERENCES.—¹*Brain*, 1918, xli, 302; ²*Paris Méd.* 1918, xi, 366-8; ³*Presse Méd.* 1918, Nov. 21, 591; ⁴*Lancet*, 1919, i, 188.

NERVES, PERIPHERAL, SURGERY OF. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

In cases of injury to the peripheral nerves, treatment, in the first instance, should be concentrated upon the muscles, tendons, and joints which depend upon the integrity of the particular nerve for performing their function. It is useless to attempt to restore the physiological or actual continuity of a nerve if chronic myositis or stiff joints prevent restoration of function. Merely the concussion of a nerve will soon show signs of recovery, but it is a mistake to wait more than a couple of months in the hope of regeneration without making an exploratory operation. If at operation the sheath of the nerve be intact, and there is a response to weak faradic stimulation, nothing should be done, and the wound closed. If, after careful mobilization of the bulbous ends of the divided nerve, or transplantation of the nerve, it is found impossible to obtain end-to-end apposition, silk should be tied round the bulbs, which are then brought together as nearly as possible. The limb is postured so as to give a maximum length to the nerve, and gradual traction applied to the nerve through the limb for some weeks. At a second operation it is usually found the ends can be brought together. It may be taken as an axiom that success will not follow 'fancy' operations on divided nerves. Bridging a gap by any material whatsoever is useless. Turning down flaps of nerves, and nerve crossing for anastomosis, are certain to fail. On the other hand, however long a nerve has been divided, success may follow an end-to-end anastomosis if all the bulbous scar tissue is carefully excised. Failing this, tendon transplantation has given excellent results. Musculospiral paralysis can be treated most satisfactorily. Good recovery in the muscles supplied by this nerve is the rule after suture, and if anastomosis is impossible, a very excellent result can be obtained by tendon transplantation. The flexor carpi radialis and the flexor carpi ulnaris are transplanted into the extensors of the thumb and fingers, and the pronator radii teres is attached to the radial extensors. To obtain success, the hand must be in full dorsiflexion when the attachments

are being made, and the transplanted tendons must run a straight course from origin to insertion. Division of the ulnar nerve is not followed by such gratifying success, but suture of the sciatic is surprisingly successful. After the division and suture of the median nerve, as a rule the terminal phalanx of the index finger does not recover sensation.

Robert Jones,¹ while drawing attention to the above, mentions a phenomenon described by Dr. Lloyd Roberts as "opposative electrical reaction". He points out that in certain conditions electrical stimulation of the muscles induces, instead of contraction of the muscles itself, contraction of the muscle or muscles whose action is exactly the reverse of that of the stimulated muscle. For example, stimulation of the extensor longus pollicis will induce contraction of the flexor longus pollicis. Roberts points out that it is not the overflow of a strong current, because the contracting muscle is not adjacent to the stimulated muscle, and the intervening muscle does not contract. This reaction is never obtained when the nerve supplying the stimulated muscle is normal, or severed, or slightly compressed, but only in conditions of severe compression.

Jones lays emphasis on the manner in which unaffected muscles replace the movements of those lost by paralysis. For example: (1) The opponens pollicis can be perfectly imitated by the ulnar adductors of the thumb in combination with the extensor ossis. (2) The extensor ossis may act as a good wrist flexor in cases of complete paralysis of all median and ulnar muscles. (3) The fingers may be closed in complete median and ulnar paralysis by extending the wrist, when the inelastic paralyzed flexor tendons acting as ligaments permit the fingers to flex mechanically. (4) The elbow may be flexed by the pronator radii teres in combined lesions of musculocutaneous and musculospiral nerves. (5) Flexion of the fingers may extend the wrist in lesions of the musculospiral, simulating the movement of the wrist extensors.

Compression of the Lower Trunk of the Brachial Plexus by a First Dorsal Rib.—J. S. Stopford² describes ten cases. In several of these, cervical ribs were associated with the condition, but in none were they responsible for the compression. An abnormally large contribution to the brachial plexus from the first or from the first and second dorsal nerves appears to be a predisposing factor. The compressing rib shows a characteristic bevelling at the point where it is moulded by the lower brachial nerve-trunk. Wood Jones has shown that the moulding of bones by nerves is a normal event: a second factor must therefore be present to cause nerve-compression. This factor is a prolapse of the shoulder. In persons whose dorsal nerves contribute largely to the brachial plexus, any condition which causes the shoulder to prolapse may lead to compression of the lower trunk of the brachial plexus by the first dorsal rib. Thus, compression may appear after fracture of a clavicle, or injury to the muscles which sustain the level of the shoulder. Out of 8 non-traumatic cases, 6 were women: all the patients were past puberty. In this connection Todd² has shown that at puberty a descent of the shoulder normally occurs, and that the descent is more marked in females than in males. Any condition accompanied by muscular weakness will tend to exaggerate this normal descent, and cause prolapse of the shoulder. If the lower brachial nerve trunk of the prolapsed limb contains a large contribution, it will probably be compressed against the first rib. Neuralgic pain along the ulnar border of the forearm is an early symptom. A very constant complaint is that a heavy garment weighing upon the shoulders, or carrying a weight on the affected side, makes the pain worse. The small muscles of the hand, and occasionally the flexors and extensors of the wrist, are paretic and wasted. Sensory symptoms include those which Stopford thinks characteristic of com-

pression as distinct from other forms of nerve-injury; in the area of altered sensation the patient feels a touch with cotton-wool, but does not feel the pain of a pin-prick. Thermal sensation is often lost. Trophic ulcers, coldness, pallor (or cyanosis), and sweating, affecting the little and ring fingers, are common. The condition is not to be mistaken for neuritis or rheumatism. The history of the case, and the distribution of the loss of pain-sensation and of heat-perception, distinguish the condition from syringomyelia. Radiculitis is usually associated with inequality of the pupils, due to involvement of the sympathetic fibres which control the dilatation of the pupil. These fibres leave the dorsal nerves and travel to the cervical ganglia in white rami communicantes, which emerge *proximal* to the point where the lowest trunk of the brachial plexus is formed. The dilator pupillæ, therefore, is not influenced by compression of the lowest brachial nerve trunk by the first dorsal rib. Aneurysm, neoplasm, and apical pleurisy are also to be considered in the diagnosis.

The operation for removal of the first rib is out of the beaten track of most surgeons, and a recollection of the anatomy involved calls for pause. The experience of the writer (W. I. de C. W.) in one case, and subsequent operations on the cadaver, lead him to say that the operation is not difficult, and may be accomplished with practically no risk. An incision is made above the clavicle, as if for ligature of the subclavian artery, and a second limb is added running parallel to the fibres of the trapezius muscle. A little dissection brings the external jugular vein, the posterior belly of the omohyoid, and the nerves of the brachial plexus, crossed by the transversalis colli vein, into view. A finger in the wound locates the back part of the first rib, much higher in the neck than is mentally assumed. The brachial nerves are drawn forwards and downwards, and the interval between the scalenus medius and levator anguli scapulæ muscles defined. The roots of the nerve of Bell in this position may not be seen, but their hidden presence is respected. The attachment of the scalenus medius muscle to the first rib is divided subperiosteally, and the inner border of bone cleared of periosteum and Simpson's fascia. Doyen's rib elevator with cleft-palate raspatories are used to bare the under side of the rib and to separate it from the underlying pleura. The rib is then divided with shears behind the scalenus medius. The segment of rib removed extends from the posterior edge of the insertion of the scalenus medius to the scalene tubercle, so as to include the groove for the subclavian artery, and the trunk formed by the 8th cervical and 1st dorsal nerves.

The Neurology of Cervical Ribs.—Church³ deals extensively with this subject. He refers to the papers of Streissler, which record 200 cases and give 297 references. Cervical ribs occur in the proportion of 70 female to 30 male. In a little more than half the cases they are bilateral, but not necessarily symmetrical; they more commonly occur on the left side. The disorders to the nerves and vessels are not relative to the size of the cervical rib. Church lays stress on the fact that unless an *x*-ray negative is particularly definite and scrutinized with great care, a cervical rib, the dimensions of which do not carry it beyond the tip of the transverse process, may be entirely overlooked. Sometimes vascular changes are as prominent as nerve disturbances. Certain positions of the arm may stop the pulse altogether. In other cases the pulse will vary with respiration, tending to disappear on full inspiration. Some cases of mis-called Raynaud's disease have been due to cervical ribs. When nervous symptoms are prominent, the sensory defect may be confined to the distribution of a single nerve, or may embrace the entire member. Pains may radiate to the back of the neck or shoulder, and down the side of the chest, but are most commonly in the ulnar portion of the hand and fingers. All varieties

of claw-hand may be encountered. Lateral curvature of the spine in the cervical region is associated with the accessory ribs.

Rovsing⁴ gives the details of four cases in which he removed cervical ribs causing various disturbances, besides the common neuralgias, from scoliosis of the cervical spine, atrophy of muscles, and vasomotor disturbance, to aneurysm in the subclavian artery. There had been no disturbance from the anomaly until taking up wage-earning work, and cessation of work brought transient relief. In three of the cases he removed the supernumerary ribs through a posterior longitudinal incision parallel to the spinous process and 2 cm. from it. The rhomboid and the trapezius muscles were cut through and the splenius pushed to one side. The cervical rib can then be felt, and it is easily detached and removed. A 'rib-guillotine', on the principle of Mackenzie's tonsillotome, is useful. There is no hæmorrhage to speak of with this technique, but its main advantage is that it avoids all danger of coming in contact with vessels or nerves. He regards this method as so harmless that practitioners and internists can confidently advise this simple and easy radical cure for disturbances from cervical ribs.

REFERENCES.—¹*Brit. Med. Jour.* 1919, Nov. 8; ²*Brit. Jour. Surg.* 1919, Oct., 168; ³*Jour. Amer. Med. Assoc.* 1919, July 5, 1; ⁴*Hospitalstidende*, 1919, May 14, 62 (abstr. in *Jour. Amer. Med. Assoc.* 1919, Aug. 2, 376).

NERVOUS SYSTEM, PARADOXICAL RESPONSE TO FARADISM IN ORGANIC AFFECTIONS OF.

J. Ramsay Hunt, M.D.

Palmer and Hanns¹ have investigated a peculiar electrical reaction of a paradoxical character first described by Babinski² in 1915. When the reaction is present, bipolar faradization of the muscles of the forearm produces a normal response; if, however, one of the poles is placed over a neutral point, as the nape of the neck, a paradoxical contraction takes place in the muscles of the forearm in relation with the other electrode: when this is placed over the extensor surface, a flexion of the hand takes place (paradoxical flexion of the hand), and when it is placed over the flexors, a *paradoxical extension of the hand* results. The test of unipolar tetanization is a fairly delicate one, and should always be controlled by testing the sound side. This paradoxical phenomenon is probably due to a subexcitability of certain muscles, which renders more apparent the action of their antagonists. The reaction may be associated with mild affections of the peripheral and central nervous system. It is absent in cases of purely psychic origin, so that it has a certain differential value in symptomatology. It denotes a perturbation of function, either organic or physiopathic, and therefore has a certain clinical value.

REFERENCES.—¹*Presse Méd.* 1918, 659; ²*Bull. de la Soc. de Neur.* 1915, July 1.

NEURASTHENIA. (See MENTAL DISEASES.)

NEUROSES OF WAR. (See also {Maurice Nicoll, M.B.

LARYNX, WAR NEUROSES OF). {J. A. M. Alcock, M.R.C.S., L.R.C.P.

INTRODUCTORY.—If there be another world conflict, it is not difficult to realize that *neurotic collapse* will form a decisive factor. The past war, in its last stages, became practically a problem in psychological medicine, for it was abundantly proved that endurance is not a physical problem alone. Under emotional strains, arising either from extremes of excitement or of monotony, human psychology splits and fractures, and severe neuroses result. In other words, the experiences of the war confirmed the view that neuroses have a **Psychological Origin** and that psychological causes can produce a profound degree of mental and bodily collapse.

It was only towards the end of the war, however, that special hospitals were established for the treatment of war neurotics where experimental work in psychological treatment was begun. As a consequence, there is a considerable number of medical observers who, having received the framework of a practical psychological training in these hospitals, now look on the therapeutical problems in psychopathology from rather diverse angles. In this country, in America, and on the Continent, many hundreds of articles have been published dealing with the difficult subject of the treatment of neuroses. It would be impossible, within the limits of this article, to deal with the various views that have been expressed; but one outstanding fact emerges, namely the recognition in practically every contribution that *a psychological medicine is now necessary to humanity*.

PERSISTENCE OF NEUROSES.—With the termination of the war the problem of the war neuroses continues, contrary to the expectation of those observers who thought that such maladies were due to malingering. Moreover, the cessation of the war has in a sense produced neuroses. Many men, who got through the war successfully enough, have found it impossible to adapt themselves to a civilian career, and have become to a greater or less extent neurotic. Thus the problem of war neuroses has now become merged with that of civilian neuroses.

THE CHANGE IN THE OBJECTIVE RELATIONSHIPS OF WAR NEUROSES.—War patients are no longer in the army, but are now pensioners, often of some years' standing. Some have remained at home untreated since their discharge; others have passed through a number of 'neurological' hospitals without much improvement, and now patronize the medical profession. The acute stages of sickness have passed, leaving chronic conditions of psychological disability. In so far as the neurosis is related to the future, we have no longer to consider the dread of returning to the front, but certain other more subtle factors, such as the surrendering of the privileges of the soldier's life for the humdrum commonplaceness of civilian life, the question of pension, of adequate recognition for past suffering, the feeling of injustice engendered by the present distribution of wealth in society, etc. It must be remembered that the neurosis is a many-sided and ever-fluctuating attitude towards life that is pathological but exquisitely sensitive, and has a connection with the attitude of society.

CLINICAL TYPES.—

1. We believe by far the commonest type of neurosis encountered nowadays—although it is not always recognized as a neurosis—is that state of psychological disability frequently met with in ex-officers and men which makes it impossible for them to take up civilian work. We may look upon this as a mild form of *psychasthenia*. Many grades are met with. We can distinguish: (a) That type of psychasthenia which dates from a definite neurotic collapse, with anxiety, battle-dreams, etc., during the war, and which still continues. Such a patient may be fatigued, dreary, anxious, strained, subject to various pains and aches. He may have a whole host of symptoms affecting the visceral system. This is a kind of diffuse neurosis, in that it is not concentrated in one symptom, but is the expression of a general reaction to life itself. (b) Patients who have had a nervous breakdown during the war and have apparently recovered, but still retain one symptom. For example, a man may complain only of insomnia, or only of stammering, or of headache or tremor or abnormal perspiration, or of sexual impotence. The original and generalized anxiety picture has faded, leaving only one prominent feature. In such patients it is possible to detect always a kind of *tenseness*. (c) Patients who have apparently got through the war perfectly well and have become neurotic afterwards. Such patients show a very marked tenseness, irritability, and restlessness, and

find it impossible to concentrate upon anything. They suffer from a difficulty in getting their interest out on to life.

2. *Conversion neuroses*, i.e., those with a definite objective disability, are not now so common, but we still see hysterical palsies and contractures that resist all treatment.

3. A small group of patients is still found who have old head injuries with various chronic symptoms, which may be easily mistaken for neurotic manifestations. It must be remembered that any injury which has led to bruising of the pia-arachnoid may give rise to chronic trouble, owing to the difficulty of the absorption of the inflammatory products from the injured zone. Trephining in such cases, allowing expansion, leads to the required absorption. Therefore, wherever there is old head injury with persistent headache, bad memory, irritability, etc., the possibility of persisting local trouble must be considered. Another type of case, in which large trephine openings exist, often develops a rather neurotic reaction to life. These large trephine openings should be closed, as the psychological effect of the operation is very valuable. A man who has a large pulsating gap in his skull does not feel quite adequate to encounter the difficulties of life.

4. Patients showing *deterioration* are encountered, and constitute a very difficult group of cases as regards treatment. There may be no evidence of epilepsy. The history may point to a transient anxiety neurosis which faded, leaving a significant alteration in character. These patients easily get into trouble; they issue false cheques, are hopelessly unreliable and extravagant, etc., and yet are not sufficiently irresponsible always to justify confinement. Moreover, they have such a poor make-up that psychological treatment is very difficult. All psychological treatment depends upon the essential moral worth of the individual.

TREATMENT.—The war neuroses fall, broadly speaking, into two main groups: (a) The conversion neuroses, in which the hysterical palsies were the predominant feature; (b) The anxiety neuroses, in which the psychical disability was the most marked. The etiology of these two forms of neuroses is a complicated problem, and seems to depend upon primary psychological types. At present very little can be said upon this matter, but the work that is being done points to some promising results. It must be remembered that the hysterical manifestations always have a symbolical value with regard to society. We mean that they are related to the social community in the sense that an individual isolated upon a desert island would not be likely to develop a hysterical palsy in the presence of some emotional shock. The etiology of the anxiety neurosis is different. Two main lines of treatment have been adopted for these two varieties of neurotic trouble: (1) Suggestive methods of re-education, with or without direct hypnosis; (2) Analytical methods.

1. *Methods of Cure by Suggestive Psychotherapy.*—As has been stated, these methods have been particularly applied to the conversion neuroses. One of the secrets of the method was to produce an 'atmosphere of cure'. On his admission to hospital, the patient was put into a ward in which the other patients were either recovering or already cured. He was told that he would see the doctor at a certain hour and that a cure would result. On coming before the doctor the method of persuasive re-education was started immediately. For example, if the patient had a closed hand that had been wounded, he was told that the pain of his wound had originally made him keep his hand closed, and that he had now acquired the habit of keeping it closed. This was technically called the 'hysterical perpetuation of a symptom', hysteria being defined as "a condition in which symptoms are present that have been produced by

suggestion and that can be cured by psychotherapy". The patient was then told that he could open his hand. Various manipulations, accompanied by suggestion, were given. Great emphasis was laid on the importance of effecting a rapid cure. If the patient suffered from tremors, he was laid on a bed and his limbs manipulated until they were all relaxed. Then he was made to practise active movements until he could perform them without tremor. In the same way a patient suffering from hysterical aphonia "sits comfortably in a chair while it is explained to him that his loss of voice is due to the fact that he has forgotten how to use it. He is told that he whispered after being gassed in order to save himself from pain, as his vocal cords were inflamed. As the inflammation and pain have now long ago passed away, there is no true need to save his voice. He is then asked to cough, as it is comparatively rare that there is any alteration in the cough. His attention is immediately drawn to the natural cough, and it is explained to him how he coughs, how in coughing he is acting the same as in speaking, so that if a man can cough he can also say 'one'. He is told to cough again and say 'one' immediately after without any pause. He often succeeds at the first attempt, and with very little additional encouragement he is soon able to talk in his natural voice" (Hurst and Gill, *Journal of Laryngology*, June, 1919). These examples illustrate sufficiently the method of cure by suggestive psychotherapy. It is a cure of the symptom itself. The factors that led to the formation of the neurotic symptom are only superficially touched. Relapses, therefore, may occur. But it is a method of great importance and value, especially when many cases have to be dealt with by one medical man.

The Avowal of the Physiological Factor. — The method of suggestive re-education is not always effective, especially in those patients in whom the neurosis is not concentrated in one definite system, but is diffuse. In such cases we are dealing with a general neurotic reaction to life itself, and we find by experience that the treatment which is directed only to the physical condition is not satisfactory. It is more especially in such cases that we come face to face with a problem which is agitating the medical world at present, and which can no longer be ignored. Do we believe in the psychological factor, or not? We have on one side those physicians who maintain that all disabilities have a physical origin, and that in so far as they are reflected in the general mentality of the patient they are secondary to some organic condition. Such physicians, and many of the more reactionary neurologists are still found in their ranks, still talk of 'nervous exhaustion' as if it were primarily an actual physical condition of the *nerves* themselves. Others pretend to take a broader view and say that it is a condition of the *brain*. We must reflect upon the strange fluctuations and multitudinous forms of the civilian neuroses, such as claustrophobia, agoraphobia, obsessive ideas and compulsive acts, tics, stammers, and so on, in the light of their being brain-cell disturbances. Does such a thing really help our understanding? How, for example, can stammering be a chronic brain-cell disturbance when it depends so much upon environmental factors? A stammerer may be perfectly free from his stammer when speaking to a friend, and yet be gripped by it when he is speaking to a stranger. The impression is borne in upon us that we are dealing with something that is psychological. Moreover, if we consider that the neuroses are due to actual brain conditions, then are we not at once confessing that they are incurable?

On the other side, we have physicians who are persuaded that the problem of the neuroses has an important psychological side which cannot be neglected. To these physicians the neurotic is a person who is sick because he does not know himself, and therefore approaches life from an artificial and unsatisfactory standpoint. It is in this sense that he is sick in his soul. *He is sick in the*

world of the psychological realities. It is useless to discuss whether a psychological reality exists or does not exist. An obsession is a psychological reality, and, in so far as the patient is concerned, it is something more real to him than the objective realities, such as his wife, or his house, or his children. To the patient, it exists. Of course we can assume the attitude of the bully to such a patient, and tell him that it is all nonsense, or apply electricity to his spine until he cries out in pain. But if we do that, we are guilty of a stupidity which has kept back the progress of medicine—a stupidity which is perhaps more generally realized by the public themselves than by doctors. Not very many years ago it was taught that the treatment of neuroses consisted either in rough handling, or—if the patients were wealthy—of rest in bed with various expensive adjuncts. The idea was that if a person were neurotic he had to pay for it. Neurosis was an expensive fad. Such a view is criminal. It is against this spirit that the younger medicine is striving and will continue to strive. For, once we take the neurosis seriously, once we recognize the amount of despair and suffering that it causes in rich and poor alike, once we begin to investigate the exquisitely delicate psychological forces on which it depends, a vast field of medicine opens out before us whose significance for the future—for the psychic health of the world—can only be faintly guessed at. For man does not live by the physical alone, but by the psychological, and if a man's values for life are wrong, he becomes sick.

From this brief review of the situation, we see that the physician must decide for himself one way or another; and that it is useless to attempt to treat neuroses other than by ordinary rest-in-bed methods, unless there is a firm belief in the psychological factor in such conditions. If the doctor *fears* to accept the psychological view—and this fear is a strange but very real thing—then let him try the latest drug. It must be remembered that the connecting link between the psychological and the physical is perhaps to be found in the *Endocrine System*, and that a mental conflict or worry may react unfavourably on the body through disturbing the normal endocrine balance. But this consideration does not dispose of the existence of the primary psychological factor.

2. Analytical Methods of Treatment.—We now come to the exceedingly difficult problem of the genuine war psychasthenic (anxiety cases). He is a person frequently met with to-day in hospital and out of it. He suffers from a variety of symptoms. He does not get well when left to his own devices. He grows more and more miserable, mopes, or becomes desperate and drinks, or commits suicide. He wastes both psychically and physically. He gets attacks of tremor, tachycardia, and other anxiety phenomena, which he often refers to as 'going over the top'. This condition seems to be continual in some. The patient remains in a state of perpetual tremor and perspiration. That psycho-physiological bracing which preceded going over the top persists, and keeps him in a continual strain. An anxiety state may be present without gross tremor. It would seem that when the original shock has been a sudden explosion, tremor is not so marked as when the patient has fought against the slow, but gradually overpowering, terror of his surroundings.

The deadly sin in dealing with neurotics is inertia. Rest in bed is only essential in the early stages, when bodily exhaustion is a marked feature. A temporary stability may be produced by rest or drugs, but a true stability, we believe, is best attained by that method of psychological re-education known as analysis. Analysis should be combined with a good environment, in which there is always something to do. In long-continuing anxiety cases there is a condition of psychological mal-assimilation. The war experiences cannot be digested. In place of a man widened and strengthened by his experiences, with no neurosis, we find a man narrowed and weakened, with a neurosis. In

place of a progression there has been a regression. How else can we reasonably deal with such a patient save by a prolonged re-examination of his life—by going into the most intimate sides of his psychological growth and submitting them to his critical judgement. For such patients have not the psychological wherewithal to live life properly. They are dazed and smashed psychologically, as any man may be when life treats him with peculiar brutality. Their values for life are shattered. A reconstruction is therefore necessary, and only by self-understanding through analysis can this be properly done. As analysis is very hard work for the doctor—there is no branch of medicine that demands greater patience and gentleness—cases must be carefully selected, because a patient without any fundamental moral worth is naturally not very promising material to work with, and it may be many months before even patients of good stamp begin to find their way out of their neuroses.

The neurosis, regarded from the analytical standpoint, is a psychological breakdown, which, to a variable extent, reacts on the physiological system. In an obscure physiological disturbance, we examine the blood, which is *the great background of physiological activity*. In the blood we find delicate but important indications—e.g., in the direction of its agglutinating or phagocytic effect. In modern psychological medicine we examine the *unconscious*, which is the great background of psychological activity. The *unconscious* is that deeper part of the mind or psyche of which in waking life we are not directly conscious, but of whose presence we become conscious in sleep. Its most characteristic product is the *dream*.

Example: An officer, about 30, seeks advice because of the following symptoms. He is perfectly well for a few days, then gets rapidly fatigued. The fatigue comes on swiftly, and with it comes a deep depression. Occasionally he gets a feeling of giddiness ("my head swims, and a mist comes over my eyes"). He has consulted neurologists, who tell him there is nothing wrong organically, and following their advice he has been to the seaside, fished in Scotland, taken tonics, etc. His condition does not change. His case is labelled *neurotic*, and he is sent to one of us for advice. He has been through the war, has been buried by a shell once, wounded once, and finally taken prisoner. He is distressed by his state, has fears about the future, looks a little drawn, and finds it difficult to be interested in either work or play. Clearly the case is difficult. Where has the investigation to proceed, once the personal and family history, reflexes, eye-grounds, etc., have been gone into? How are we to get into the psychological side of such a case rapidly, for the purpose of estimating the degree of psychological disturbance? It is best to ask about his sleep first, and from that to lead on to dreams. He replies immediately that he is troubled with dreams, and that formerly he never dreamt. Here at once is an indication—a point from which it may be possible to gain access to some of the underlying trouble. The dreams are "all of the same kind. I dream that I am up against some one, often an unknown person, who is evil or hostile, and very clever. I fight a losing battle with him. Sometimes the scene is a kind of war—I am on a warship or in a trench, and he comes along and outwits me. Sometimes I am trying to do some quite ordinary thing, such as arranging a room, and he comes along and interferes. He is never the same person, but he always has the same intention. He is sometimes a German officer. Once or twice I have managed to get the better of him and waked up feeling very satisfied". The dream at once shows us a psychological problem in that pictorial and dramatic language that is peculiar to unconscious thinking. In such a case, analysis is indicated. The problem—the psychological enemy—must become fully conscious to the patient, for it is clear, from the nature of the dreams, that he is *psychologically split*—that he is a house divided against itself. When we are

psychologically split, a condition of *neurotic conflict* exists which leads to sudden disturbances. To such a patient, therefore, we are entitled to say that he certainly has a psychological problem which may be entirely, or partly, responsible for his unsatisfactory state, and that an analysis, the aim of which is to make him understand the inner meaning of his psychological situation, is advisable. Such an analysis will take several months, for self-knowledge is something not taught in schools and not easily accepted by many. But in so far as a neurosis is a soul-sickness, the remedy does not lie in simple appliances.

TRANSFORMATION OF THE NEUROSIS.—It must always be remembered that a neurosis is capable of shifting its point of application. For example, a hysterical palsy may be cured by suggestion, but instead of the previous complacent mental picture we may find after a cure of the symptom a mild anxiety neurosis. Janet called this "the disposition to equivalencies"—that is, the tendency of one apparently quite different symptom to take the place of some other. Pridaux quotes a case (*Lancet*, Feb. 8, 1919) of a patient who had been a stammerer since childhood, and at the age of 21 developed a monoplegia of the right arm and completely lost his stammer. The monoplegia was cured, but the stammer immediately returned, and had to be removed by mental analysis. Therefore, it would appear that the mere curing of symptoms in hysterical manifestations is not necessarily a cure of the underlying psychological causes.

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NIPPLE, PAGET'S DISEASE OF. (See PAGET'S DISEASE OF THE NIPPLE.)

NODULES, JUXTA-ARTICULAR, IN THE TROPICS.

E. Graham Little, M.D., F.R.C.P.

Several cases have been described, occurring in the tropics, of an eruption of nodules, usually symmetrical, few in number, and distributed near joints, especially the ankle and knee. They are hard, subcutaneous, painless, sessile tumours, with some resemblance to molluscum fibrosum. Histological examination by various observers shows a curiously varying structure, and in one previous instance a fungus was grown from one of the nodules. Currie and Hollman¹ now report a new case in which they were able to grow an aspergillus from a nodule on the foot of a Hawaiian native, who had a coincident leprosy (probably accidental association).

REFERENCE.—¹*New Orleans Med. and Surg. Jour.* 1919, March, lxxi, No. 9, 384.

NOSE, AFFECTIONS OF. (See NASAL CATARRH, etc.)

For new method of applying **Nascent Iodine**, see p. 9.

ÆSOPHAGUS, DISEASES OF. (*See also* X-RAY DIAGNOSIS, p. 19.)*P. Watson-Williams, M.D.*

Spasm of the Æsophagus.—Whether œsophageal spasm may be a cause of clinical obstruction of the œsophagus is a debated point, but one of the main arguments advanced in support of the 'spasm theory' is the disappearance of the dysphagia which sometimes follows the passage of a bougie. In this connection Brown Kelly's¹ observations on spasm at the entrance of the œsophagus lend support to the view that spasm is the essential factor. The history of a long period of anæmia, dyspepsia, and impaired general health preceding the onset of the symptoms was occasionally given, and several of the patients were neurotic. On the other hand, the dysphagia was regarded as primary by a fair proportion of the patients, and the disturbance of nutrition and nervousness in connection with swallowing as secondary. The symptoms need only be briefly enumerated: dysphagia referred to the level of the larynx; necessity of masticating thoroughly and swallowing carefully—dietary consequently reduced to semi-solids; frequent catching of a fragment of food at the mouth of the œsophagus, with distressing efforts to dislodge it; regurgitation of liquids on attempting to wash down the impacted body; nervousness in regard to eating, especially in the presence of strangers, and preference to have meals alone and at leisure.

In order to determine whether the obstruction is due to spasm, or to an organic stricture, resulting possibly from cicatricial contraction or from the union of adjacent surfaces, it was necessary to determine the local condition at fault. Brown Kelly therefore selected cases in which very pronounced dysphagia had been constantly present for years, and in which no bougie had been used. In these the entrance to the œsophagus was carefully inspected under chloroform. Ten such patients were dealt with, in whom respectively the duration of the dysphagia had been 2, 3½, 5, 7, 8, 10, 12, 23, and 33 years, and in a patient aged forty-four as long as she remembered. On inspection, it was found that the deepest part of the hypopharynx did not present the usual sphincter-like appearance. Instead of rounded folds, or cushions of mucous membrane forming a stellate arrangement, tense bands passed in various directions with their thin edges tightly pressed together. The entrance to the œsophagus appeared as a pin-hole, or small irregular opening, or obliquely placed slit, and was not always in the middle line. Sometimes one half of the mouth of the gullet seemed closed by a web passing backwards from the cricoid.

The manner in which the appearances varied with the position and pressure of the endoscope, the rigidity of the tissues, and the caution necessary to avoid tearing any membrane that might be present, made the examination difficult. In several of the earlier cases, while manipulating the tube to obtain a fuller view, and in spite of all precautions, it suddenly slipped onwards into the œsophagus, and he was left in doubt as to whether a spasm had yielded or a membranous stricture had been ruptured. To determine this point in subsequent cases, a small-sized metal urethral catheter, which had been straightened, and over the end of which the tip of a finger-stall had been tied, was passed through the constricted opening into the œsophagus, and the bag was then blown up and withdrawn. From the manner in which the folds of mucous membrane fell apart, it became evident that the stenosis had been due to their firm approximation, and not to organized adhesions between them. An œsophagoscope of large calibre was passed in order to dilate the mouth widely. The gullet was usually found unduly patent, and occasionally pale and dry. The results following the procedure described were striking, and apparently more lasting than those obtained by the passage of bougies.

Brown Kelly observes that of his cases of cancer in the hypopharynx and at the mouth of the gullet, over 75 per cent occurred in women, while of those of cancer elsewhere in the œsophagus, over 80 per cent occurred in men; whereas in cardiospasm and enterospasm the sexes are affected about equally. He cites also the case of a man whose symptoms led him to believe he had spasm of the upper end of the gullet, with dysphagia, for nine months previously, but who was unable to swallow anything after a piece of veal which had lodged in the hypopharynx had been dislodged. Direct œsophageal examination revealed a malignant growth a short distance above the hiatal level, but the passage of the œsophageal tube greatly relieved him for several weeks. The need for cautious examination before pronouncing a case one of simple spasm is obvious.

In explanation of spasm arising from slight irritation or traumatism, Brown Kelly suggests that in the innervation of the whole alimentary tract we may find the solution; for apart from the other nerve-supply, the gangliated plexuses of Auerbach and Meissner form in themselves a complete arc, so that stimuli received by the sensory portion (Meissner) are conveyed by communicating fibres to the motor portion (Auerbach). If there is a disturbance of balance between the two, and the sensory is in a hyperæsthetic state or unduly irritated by a foreign body, fissure, or inflammatory condition, or if the motor is unduly stimulated, it is probable that abnormal local contraction or spasm will result.

Another type of dysphagia, somewhat akin to spasm, is the subject of a contribution by D. R. Paterson.² The affection is associated with a patchy glossitis and similar mucosal conditions in the hypopharynx and even in the upper section of the œsophagus, while the thinning of the mucosa is most notable over the posterior surface of the cricoid. It is significant that Paterson draws attention to the not infrequent supervention in such cases of malignant disease at the mouth of the gullet. This happens too often to be merely a coincidence. In more cases than one under his observation for a long period this termination has occurred. Paterson concludes: (1) That spasmodic dysphagia in women is sometimes associated with definite changes in the upper food-passages—if they are not the sole cause of spasm, in all probability they increase the tendency; (2) That the association produces a more obstinate type of dysphagia, both in relation to treatment by dilatation and in the effect on the general condition of the patient.

Cicatricial Strictures of the Œsophagus.—These may present many difficulties in treatment. Hubbard³ records his observations on 'lye strictures', cicatricial constrictions which are due to swallowing caustic alkaline solution, usually by children, and which generally occur at the level of the cricoid or about the depth of the bronchial region and above the hiatus, owing to the arrest of the corrosive fluid about these points. In one of his cases the lower three or four inches of the œsophagus were constricted into a narrow tortuous canal with intervening sacculations, and this with difficulty permitted the passage of a filiform bougie. But where patients exhibit extreme water hunger he advocates a preliminary gastrostomy so as to permit of dilatation being more deliberate. Hubbard advocates forcible dilatation for single strictures of limited areas; but in lower tortuous multiple strictures with intervening sacculation, such as are usual in 'lye' cases, he considers forcible dilatation quite impracticable and hazardous.

Sencert⁴ advocates treating severe cicatricial stenoses of the œsophagus from below after a gastrostomy, the purpose of which is not the alimentation of the patient, but to provide a route of access to the lower orifice of the stricture; thus the important point is that the orifice should be large enough to give ample

approach, and it is effected by a vertical incision along the external edge of the rectus, or by an oblique incision parallel to the costal border. The bougie is subsequently passed by the mouth and manipulated through the stricture. Prior to the war, Sencert had 12 successful cases, and had had 2 more since.

Ranzi⁵ advocates treatment of severe strictures by a plastic operation, consisting in the interposition of a portion of the jejunum in the œsophagus above the stricture, and the subsequent attachment of the jejunum to the stomach below the cardiac orifice. He reports three cases successfully treated by this manoeuvre.

REFERENCES.—¹*Jour. Laryngol. Rhinol. and Otol.* 1919, Aug., 285; ²*Ibid.* 289; ³*Jour. Amer. Med. Assoc.* 1918, Nov. 23, 1706; ⁴*Jour. de Chir.* 1918, xiv, 553 (abstr. in *Sury. Gyn. and Obst.* 1918, Dec., 470); ⁵*Wien. klin. Woch.* 1919, No. 10, 247.

OTITIS MEDIA. (See EAR DISEASE.)

OZÆNA.

P. Watson-Williams, M.D.

A. J. Wright, M.B., F.R.C.S.

TREATMENT.—A method of treatment for ozæna has been introduced by Benians and Hayton,¹ the rationale of which depends on the generally accepted view that, whatever the causative organism of the disease, the factor arises as a result of bacterial decomposition in an alkaline medium of proteins similar to that which normally takes place in the intestine. Treatment in the past has been directed towards attempting either to destroy the organisms locally by disinfectants or to raise the resistance of the individual by vaccines. In the method now described, the object has been to substitute a carbohydrate medium for the alkaline protein medium, in order that the infecting proteolytic bacteria may be replaced by the harmless glycolytic bacteria normally found in the vestibule of the nose, the theory being that these latter bacteria create, by the fermentation of the carbohydrate bodies, an acid medium inhibitory to the activities of the proteolytic organisms. A mixture of pure **Glycerin** with 25 per cent of liquid **Glucose** is freely applied with a cotton-wool applicator to the whole of the nasal cavity, in the first instance by the surgeon and subsequently by the patient at home. The entire success of the treatment depends on a free application to the whole of the mucous membrane affected, at first four or five times daily, and, as improvement takes place, less frequently. From time to time the flora of the nose is examined to note the cultural properties of the bacteria present and to determine whether or no they are of the strain to ferment the media supplied. In a series of ten cases treated over a period of two years the results were satisfactory. Crusting and fetor disappeared, the atrophy, however, naturally remaining. [We have employed this method in a number of cases, and can confirm the statement that the results are a considerable advance on those obtained by douching, and with much less inconvenience to the patient in carrying out the treatment.—P. W.-W., A. J. W.]

Schatz² has endeavoured to repeat the experiments of Perex, and isolate the *B. fœtidus ozænae*. He obtained entirely negative results by cultural methods; but with inoculations with vaccines of the *B. mucosus* of Friedländer from ozæna cases, Ersner,³ in conjunction with Schatz, obtained marked improvement in most of their cases: 16 patients were treated, with 2 apparently very successful results and 7 failures. It was necessary to use large enough doses to produce a general reaction.

REFERENCES.—¹*Jour. Laryngol.* 1919, Sept., 325; ²*Laryngoscope*, 1919, Jan. 17; ³*Ibid.* 22.

PAGET'S DISEASE OF THE NIPPLE. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

Sampson Handley¹ gives illustrations from a case of this disease, and states that the eczematous thickening of Paget's disease is not the precursor but the result of subjacent cancer, which may or may not be palpable, commencing near the nipple. He thinks that the cancer begins in a duct, and that the lymphatic vessels running from the duct become permeated with cancer cells (*Plate XXV, Fig. A*). The perilymphatic tissues are infiltrated with round cells, and become fibrosed, and the lymph-vessels with their cancerous contents are strangulated (*Plate XXVI*). A lymphatic block thus extends to the subareolar lymphatic plexus, damming up the lymph in the nipple, and causing degeneration of the superficial layers of epithelium, with proliferation of the deeper layers. The dermis becomes the seat of a solid lymphatic oedema. These changes are nutritional and not malignant.

Sir James Paget found that in every case in which he excised the eczematous nipple, a carcinoma subsequently appeared in the breast. Handley advises a radical excision of the breast, including removal of the pectoral muscles, with the axillary glands and fascia, whenever Paget's disease is diagnosed.

REFERENCE.—*Brit. Jour. Surg.* 1919, Oct., 183.

PAPPATACI FEVER, *Sir Leonard Rogers, M.D., F.R.S.*

J. W. D. Megaw¹ discusses the relation of sandfly fever to dengue, and maintains that it is but a three-day variety of the latter, there not being sufficient grounds for the differentiation of the two fevers. He thinks that the utmost that can be said is that sandfly fever "is a disease which is either one of the modifications of dengue or is closely related to dengue".

REFERENCE.—*Ind. Med. Gaz.* 1919, July, 241.

PARALYSIS AGITANS. *J. Ramsay Hunt, M.D.*

The nature of paralysis agitans has been an attractive subject for investigation ever since the publication of Parkinson's celebrated *Essay on the Shaking Palsy* a century ago. Many strange theories have been advanced, and innumerable lesions suggested in explanation of the peculiar phenomena of this interesting disease; but as our knowledge of the pathology and physiology of the nervous system has advanced, many hypotheses, at one time popular, have been discarded and now have only an historical interest.

PATHOLOGY.—J. Ramsay Hunt,¹ under the title "Primary Atrophy of the Pallidal System of the Corpus Striatum", makes a further contribution to the nature and pathology of paralysis agitans. In recent years, pathological interest has been chiefly centred in the large basal ganglia—the corpus striatum and the optic thalamus—more especially since the publication of Jellgersma's brief report of the pathological findings in this disease. The author's conclusions are based upon a careful pathological examination of three cases of paralysis agitans—two of the presenile type and one of the juvenile type. In the examination of the central nervous system, especial attention was given to the basal ganglia. In these structures there were no evidences of gross lesions, such as hemorrhage, softening, or inflammation. The blood-vessels were somewhat thickened, especially in the region of the globus pallidus, where a slight appearance of *état criblé* was produced. There were, however, no evidences of thrombosis. The most striking pathological changes noted were in the large motor cells of the caudate nucleus and putamen. Many of these giant pallidal cells of the neostriatum were in various stages of chronic cellular atrophy (*Plates XXVII-XXIX*). The cells were reduced in size, the bodies shrunken, the processes atrophic and shrivelled, with an elongated contracted nucleus occupying a lateral position in the cell body. Pyknosis of the nucleus

PLATE XXV.

PAGET'S DISEASE OF THE NIPPLE

(SAMPSON HANDLEY'S CASE)

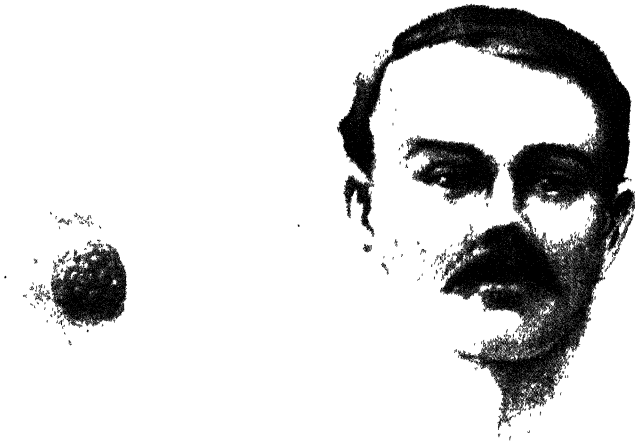


Fig. A.



Fig. B.

Fig. A.—The right nipple, natural size. The artist has rather exaggerated the papillary character of the surface. It is surrounded by a rather congested zone of areolar pigmentation. *Fig. B* shows the case. The right nipple has been replaced by a flatish, bright-red papillary surface, beneath which a small hard growth could be felt.

By kind permission of the 'British Journal of Surgery.'

PLATE XXVI.

PAGET'S DISEASE OF THE NIPPLE—continued



Fig. A.—($\times 74$.) A section vertical to the skin surface through the edge of the area of Paget's disease from the same case. The anatomical arrangement of the permeated lymphatics is here very well shown. A group of the blind finger-like ampullae of origin in the papillae are seen uniting to form a narrower lymphatic vessel which runs obliquely through the deeper layers of the dermis in the direction of the subareolar plexus.

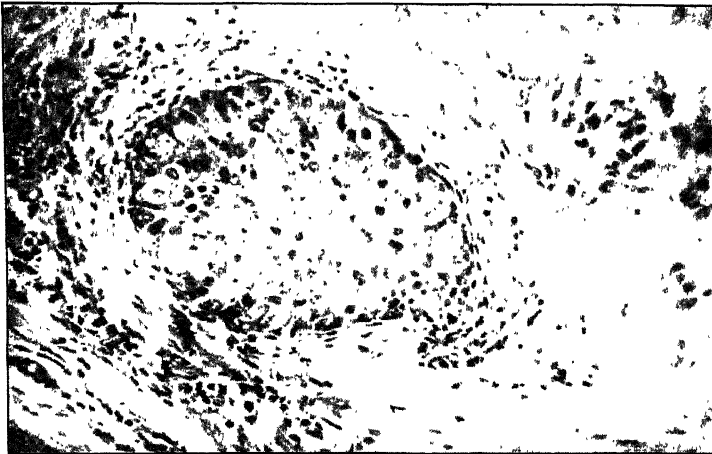
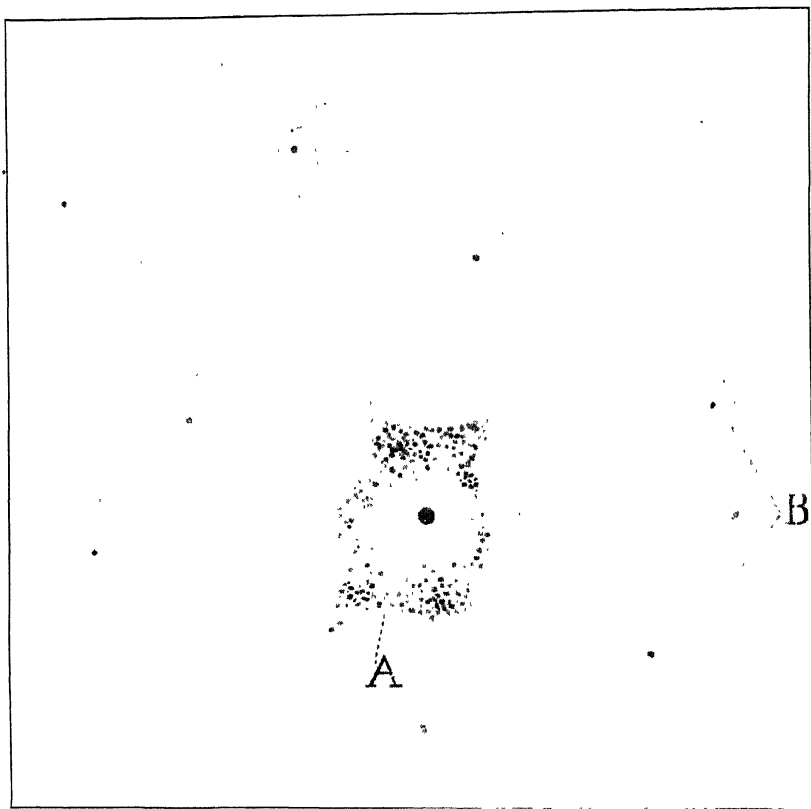


Fig. B.—($\times 134$.) A partially fibrosed permeated lymphatic from the deeper layer of the dermis in a case of Paget's disease. A group of degenerate cancer cells is seen, surrounded by a sheath of newly-formed fibrous tissue. Such permeated lymphatics can frequently be demonstrated in the deeper layers of the dermis.

PLATE XXVII.

PARALYSIS AGITANS

(J. RAMSAY HUNT)



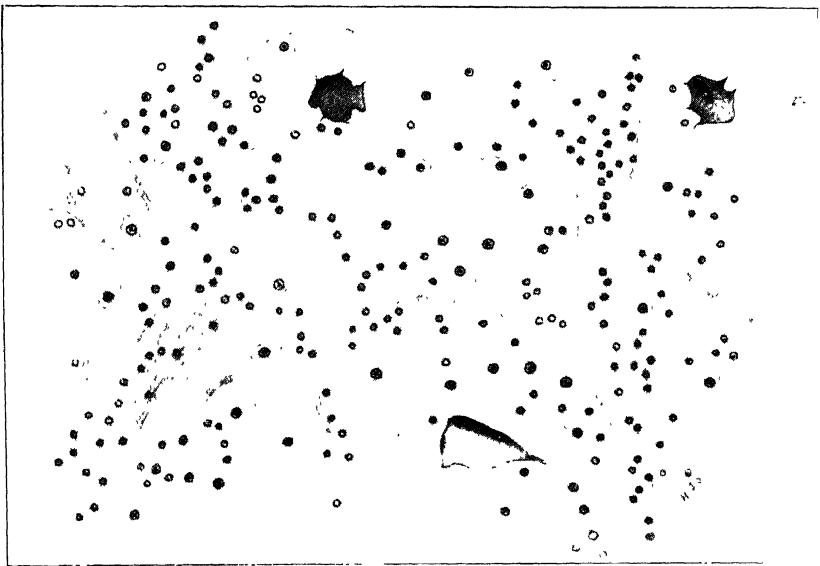
Showing normal cell types of the caudate nucleus and putamen (neostriatum). Nissl stain. A, Large motor cell of globus pallidus type (pallidal cells). B Small ganglion cells of the neostriatum (neostriatal cells).

By kind permission of 'Archives of Internal Medicine.'

PLATE XXVIII.

PARALYSIS AGITANS--*continued*

(J. RAMSAY HUNT)

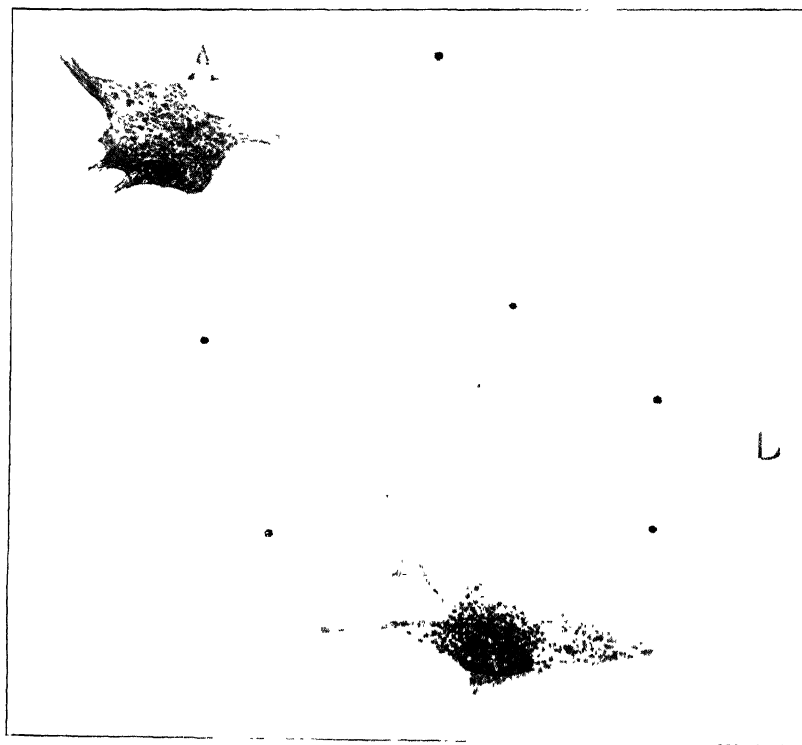


The caudate nucleus (hematoxylin-eosin). Juvenile paralysis agitans of twenty-five years' duration. Note atrophy of the large motor cells (A) of globus pallidus type (pallidal cells). The small ganglion cells are well preserved; there is moderate increase of glia cells.

PLATE XXIX.

PARALYSIS AGITANS—*continued*

(J. RAMSAY HUNT)



Showing atrophic ganglion cells of the caudate nucleus and putamen (neostriatum), Nissl stain. Progressive paralysis agitans of ten years' duration. A, Atrophy of large motor cells of the pallidal type; B, Small ganglion cells are normal.

was a very striking feature in many cells, while in others the entire cell was much shrunken and diffusely stained. Many cells showed evidences of advanced pigmentary degeneration, and many of the perivascular and pericellular spaces of the corpus striatum contained pigment detritus and yellowish lipoid material. The large cells of the striatum did not appear to be reduced in number, but were simply in various stages of chronic atrophy; there was no noteworthy increase of the glia cells in this region.

In contrast to the atrophic changes in the giant pallidal cells of the neostriatum, the small ganglion cells of this region (neostriatal cells) were preserved, both in number and appearance, and were free from evidences of atrophy. The cellular changes were more pronounced in the anterior portion of the corpus striatum, although occasional atrophic cells of the large globus pallidus type were demonstrable as far posteriorly as the tail of the caudate nucleus.

The motor cells of the globus pallidus proper (the paleostriatum) were not reduced in number, and in comparison with the giant pallidal cells of the neostriatum were well preserved. Many of these cells gave the impression, however, of being somewhat reduced in size and of presenting a more rounded and angular appearance than do normal cells. Their internal structure, including the nucleus and the nucleolus, was well preserved.

In serial sections, stained by the Weigert-Pal method, certain pathological changes were also apparent in the corpus striatum. The medullary network of the globus pallidus, especially in its anterior portion, had suffered some reduction in the number of its nerve fibres, and the external segment had apparently suffered more in this respect than had its internal segment. The reduction was present in both the external medullary and the supplementary external medullary layer. The ansa system—namely, the strio-hypothalamic radiations—also showed some thinning and atrophy of its fibre systems.

With the exception of pathological changes in the efferent pallidal system noted above—namely, chronic atrophy of the giant pallidal cells of the neostriatum, a reduction in the fibre network of the globus pallidus, and atrophic thinning of the fibres of the ansa system—the central nervous system appeared normal.

SYMPTOMATOLOGY.—The cardinal symptoms of paralysis agitans are three in number, and consist of paralysis, rigidity, and tremor. The great variation in the clinical picture is dependent on the extent of involvement of the musculature and the degree in which these three fundamental symptoms are present. In the common form of the disease all three symptoms are usually present in combination, there being simply a tendency to gradual progression. In other cases, especially in the earlier stage, one symptom may dominate the clinical picture, or even be present alone, so that certain special types are recognized. For example, there is a rigid type, the *paralysis agitans sine agitatione*, and a rare tremor type, the *paralysis agitans sine rigiditate*.

Paralytic Disturbance.—The motor disability of paralysis agitans is dependent on the rigidity and a curious type of palsy, which differs from other forms of paralysis by reason of the nature of the paralytic phenomena. The paralysis is limited to the automatic and associated movements of the body, and presents a striking contrast to the corticospinal type of palsy, in which there is a loss of isolated synergic, or dissociated, movements. It is, the author believes, largely for the same reason that there is so much delay and difficulty in initiating movements, as, for example, in rising from the sitting posture. In such movements the associated activities of massive muscle groups are impaired, and it is only by great effort of will that the defective automatic function is replaced by corticospinal activity. Very interesting defects in the association of move-

ment are manifested in the upper extremities. For example, one of the earliest and most characteristic symptoms of the disease is the loss of rhythmical associated movements of the arms in walking. The patient with paralysis agitans walks with the arms held stiffly by the side. Under normal conditions the arms swing alternately with the legs in walking or running, thus simulating the use of the forelegs in quadrupeds. Dupré quite correctly interprets this phenomenon as a vestigial manifestation—a remnant in the biped of a more primitive quadruped gait. This rhythmical action of the arms in walking, running, and jumping, is lost comparatively early in the disease, and yet the ability to swing the arms voluntarily shows no impairment. Again, if the attempt is made to open the hand, the fingers slowly unfold and extend, but there is not the marked abduction of the thumb and spreading of the fingers which takes place normally; and if the hand is closed quickly, as in grasping an object firmly, the fingers flex and are folded into the palm, but without the sharp associated movement of extension of the wrist, which is present in every normal person (absence of the extensor kick).

In striking contrast to losses in the sphere of the automatic and association activities of movement, is the *preservation of specially acquired movements* of cortical origin. These are carried out quite correctly in every detail, except for the difficulties produced by the tremor, rigidity, and the paralysis of associated movements.

The Rigidity.—A conspicuous symptom of paralysis agitans, and one which contributes very materially to the general motor disability, is the rigidity. Stiffness of the musculature is a large factor in producing that slowness of movement which, with loss of the automatic and association activities of muscles, causes the peculiar facial expression, attitude, and gait which are so characteristic of the disease. This rigidity is unquestionably of central origin, as is the spasticity which characterizes the paralysis of pyramidal-tract disease. It presents certain differences however. The muscles are quite firm to touch, their contour is well defined, and there is a state of continuous hypertonicity which gives to passive movements an impression of wax-like rigidity. In this respect the hypertonia of paralysis agitans differs from that of spastic paralysis. It is more plastic, while that of the spastic state is more elastic in character. Passive movements in paralysis agitans show that the continuous rigidity is often broken by a peculiar rhythmical sensation due to an intrinsic tremor tendency of the muscle substance.

It is generally held that the hypertonicity of spastic states is caused by a loss of the cerebral inhibitory function, and that when the connections between the motor cortex and the motor cells of the spinal cord are severed, spasticity results. It would thus appear that a higher motor centre, in order to be effective, must control the spinal mechanism which is engaged in the regulation of tonus, and that when this control is lost hypertonicity results. A similar explanation may be offered for the occurrence of rigidity in paralysis agitans. According to the author's conception, this disease is the result of an atrophy of the essential motor projection system of the corpus striatum—the *pallidal system*—which exercises a controlling influence on the lower spinal mechanism through the medium of the extrapyramidal motor tracts. As the corpus striatum represents a higher controlling motor mechanism, although phylogenetically much older than the corticospinal system, it also must control or inhibit spinal tonus, and when this inhibition is lost, hypertonicity of the musculature results.

The Tremor.—The third characteristic symptom of paralysis agitans is the tremor. This curious motor disturbance consists of an involuntary tremor movement, rhythmical in character, varying from three to five vibrations to

the second. It continues during rest, and is therefore spontaneous and not dependent on movement or posture. The tremor of paralysis agitans has the same *tempo* in all of the parts affected, and at times nearly all muscles may be involved, including even those of the vocal cords and eyeballs.

NATURE OF PARALYSIS AGITANS.—The essential and characteristic symptoms of the disease are those which have just been considered—namely, a paralysis of automatic and associated movements, wax-like rigidity, and spontaneous rhythmical tremor. All of these symptoms Hunt refers to atrophic changes in the pallidal system of the corpus striatum. Paralysis agitans is, therefore, a special type of central palsy, due to a loss of function of the striospinal system, in contradistinction to spastic paralysis, which results from disease of the corticospinal system. It is, properly speaking, therefore, not a disease, but a characteristic type of palsy which may result from a variety of pathological lesions, including such conditions as senile atrophy, vascular degeneration, and various gross lesions of the corpus striatum—for example, softening, hæmorrhage, tumours, encephalitis, and syphilis.

As the vast majority of paralysis agitans cases occur in the presenile period of life, many of which last into senility, it is not surprising that evidences of mental disturbance and deterioration are often associated with this disease. The same is true of certain sensory symptoms, subjective and rarely objective, which are probably referable to associated senile or vascular changes in the optic thalamus. To regard these symptoms as essential to paralysis agitans would be similar to incorporating various sensory symptoms complicating spastic forms of palsy as something essential and characteristic. Such symptoms are referable to the general pathological processes, and are not in any sense peculiar or essential to paralysis agitans. The secretory, vasomotor, and trophic symptoms are neither constant nor characteristic, and are to be regarded as secondary and not primary manifestations of this form of palsy.

We must recognize, therefore, in the central nervous system, three systems which subserve the functions of motility—a *segmental system*, with its various reflex functions; the *striospinal system*, with its control of automatic and associated movements; and the *corticospinal system*, with its higher quality of discriminative and dissociated movements. All three systems represent different stages of evolutionary development, and all are concerned in the elaborate function of motility. Each system, as it is superadded, utilizes those of earlier development. Therefore, in nearly all movements these various components are represented, the degree of representation varying with the character of the movement. (*See also NERVES, PERIPHERAL.*)

REFERENCE.—¹*Arch. Internal Med.* 1918, xxii, 647.

PARALYSIS, GENERAL. (*See GENERAL PARALYSIS.*)

PARATYPHOID FEVER. (*See also TYPHOID FEVER.*) J. D. Rolleston, M.D.

Paratyphoid Fever A.—A. Campani and F. Bergolli¹ regard paratyphoid fever A as a disease intermediate between typhoid and paratyphoid fever B, and describe its specific characters as follows: Steep and sudden rises of temperature frequent; severity greater than that of paratyphoid fever B and less than that of typhoid; duration of fever longer, and epistaxis and dermographism more frequent, than in paratyphoid fever B.

Lemierre and Taberlet² report a case of suppurative thyroiditis due to the paratyphoid A bacillus in a soldier the subject of goitre; he was admitted to hospital with a febrile disease complicated by pulmonary congestion, which was at first regarded as influenzal. A pure culture of the paratyphoid A

bacillus was obtained from the pus in the thyroid abscess, and the patient's serum agglutinated the paratyphoid A bacillus in a dilution of 1-200.

Paratyphoid Fever B.—According to Campani and Bergolli,¹ paratyphoid fever B is a less serious disease than either paratyphoid A or typhoid fever, and is more closely allied to gastro-enteritis. Its differential characters are as follows: Abortive forms more frequent; duration of fever less; initial rigor rarer; sweating and epistaxis rare; no intestinal hæmorrhages; prodromal diarrhœa more frequent; respiratory complications less frequent; superficial abscesses more frequent.

Süssenguth² reports a case of *perforative peritonitis* which occurred after ten days' indefinite illness in a case of paratyphoid B infection. The patient, a man aged 49, was operated on sixteen hours after the perforation, and made an uneventful recovery. A similar case of perforative peritonitis in a man aged 24 is recorded by Heidler³ in the fourth week of paratyphoid fever. Recovery took place, although the operation was not performed until forty hours after the perforation. Serologically it was impossible to say whether the disease was due to the paratyphoid A or B bacillus, as both were agglutinated in an equally high dilution (1-1600).

A fatal case of *meningitis* due to paratyphoid B infection is related by Hundeshagen⁴ in an infant aged 3 months. The necropsy showed purulent meningitis, and pyelitis of the left kidney, which contained small abscesses. Examination of the cerebrospinal fluid after death showed paratyphoid B bacilli, which were also cultivated from the renal abscesses. The meninges had probably been infected from the kidney.

The presence of the paratyphoid B bacillus in pure culture in an *ovarian abscess* is reported by Feldmann⁵ in a woman, aged 32, who had no previous history of enteric fever, but had suffered from abdominal pain, chiefly in the cæcal region, for four years. Feldmann suggests that the bacillus had reached the ovary either from the intestine, in which it had lived a saprophytic existence, or from the vagina like the gonococcus.

J. H. Abram and E. Glynn⁷ report two cases of paratyphoid B infection of the pleura, one of which was an example of serofibrinous pleurisy following a disease diagnosed clinically as typhoid, and the other was one of empyema in which there had been no intestinal symptoms.

E. Stolkind and A. Lorey⁸ record 23 cases of paratyphoid B fever in infants and children, including a case of intra-uterine infection.

An infection in Mesopotamia due to a bacillus of the Gaertner-paratyphoid group, is described by W. MacAdam.⁹ The organism, though culturally and morphologically indistinguishable from *B. paratyphosus B*, was inagglutinable even in low dilutions of the high-titre sera for *B. typhosus*, *B. paratyphosus A*, *B. paratyphosus B*, and *B. enteritidis* (Gaertner). Marked involvement of the respiratory tract was the principal clinical feature, and the symptoms and course of the fever did not suggest an enteric group infection.

REFERENCES.—¹*Osp. Maggiore*, 1918, 92; ²*Bull. et Mém. Soc. Méd. Hôp. de Paris*, 1919, ii, 513; ³*Med. Supp. Rev. Foreign Press*, 1919, 71; ⁴*Ibid.*; ⁵*Ibid.*; ⁶*Ibid.* 63; ⁷*Lancet*, 1919, ii, 283; ⁸*Brit. Jour. Child. Dis.* 1918, 161; ⁹*Lancet*, 1919, ii, 189.

PAROTID GLAND, SURGERY OF. *Sir W. I. de C. Wheeler, F.R.C.S.I.*

Post-operative Parotitis.—C. Collins¹ found that parotitis occurred as a post-operative complication in seven out of a series of 6100 operated cases. All seven had laparotomies. In five cases both glands were inflamed; in two suppuration appeared in the parotid; one patient developed parotitis while awaiting laparotomy. Five of these cases died; in two cases the 'parotitis' was evidently the principal cause of death. Following J. Frank, Collins believes

that secondary parotitis is due to infection ascending by Stenson's duct. He notes that Roberts and Oliver² state that, in a series of 470 cases of gastric ulcer treated by oral starvation, there were 4.5 per cent cases of parotitis; while in 430 cases which were allowed fluid by the mouth, the evidence of parotitis was 0.4 per cent. Fenwick treated over 300 cases of hæmatemesis by rectal feeding, allowed his patients to suck an indiarubber teat, and had no case of parotid inflammation. Collins concludes that:—

1. Post-operative parotitis is more apt to occur after abdominal operations than operations on any other part of the body.

2. Its development is favoured by a dry condition of the mouth and a lack of fluids in the body.

3. In patients whose abdominal condition makes it necessary to withhold food and drink from the mouth and stomach for a time, prophylactic treatment should be instituted.

4. A good way to excite the secretions of the mouth and to keep a current of saliva flowing down Stenson's duct is to allow the patient to suck on a stick of lemon candy after operation.

5. Fluid may be supplied by hypodermoclysis, leaving needles in the axilla for four or five days to avoid the pain of re-insertion. [We have long practised this merciful method of hypodermoclysis, especially in children and in sensitive patients: a little B.I.P.P. round the point of entry of the needle prevents infection from the skin.—W. I. de C. W.]

6. If the prophylactic treatment fails and parotitis develops and the inflammation is increasing, or is no better by the third or fourth day, the gland should be uncovered by a free incision and punctured in several places with blunt forceps, and the incision packed with wet sterile gauze as suggested by Blair.

Parotid Fistulæ.—Ceballos and Bacigalupo³ recommend resection of the auriculo-temporal nerve for parotid fistula. The nerve transmits secretory branches by the otic ganglion. Incision is made just in front of the tragus from the lobule of the ear to the zygoma. The nerve is isolated and divided as far from the surface as is possible. Morestin also published good results by this method.

P. P. Cole¹ classifies fistulæ of the parotid as: (1) *Fistulæ of the gland*; (2) *Fistulæ of the duct*. The latter may be complete or incomplete. He points out that gland fistulæ and incomplete fistulæ of the duct tend to heal, and never fail to respond to radiotherapy. Two hundred milligrams of radium are employed in a $\frac{1}{2}$ -mm. platinum tube encased in 3 mm. of lead, in order to cut off as much of the beta radiations as possible. The whole is enclosed in rubber tubing. The skin is covered with lint to cut off secondary radiations from the metal filters. A three- or four-hour exposure is given to the area affected. If the skin is indurated, a six-hour exposure may be requisite. For complete fistulæ of the duct, Cole condemns operations, and those for resection or avulsion of the auriculotemporal nerve: he has seen unilateral dryness of the mouth follow this interference with the secretory nerve-supply of the gland. Cole describes a method of treating these fistulæ in which the duct is shut off from the mouth and shortened. His operation brings the mouth cavity to the shortened duct. A curved incision is made with convexity down and a small flap reflected upwards (*Fig. 36*). This displays the duct, the distal end of which is ill-defined and buried in scar tissue. A small lateral hole in the duct marks the limit of patency. The duct is then freed, its terminal portion resected, and two very fine catgut traction sutures are passed through its walls. The mucous membrane covered by buccinator is then made prominent immediately in front of the masseter by means of a small swab pressed against it from inside the mouth, and a small incision is made through it into the mouth (*Fig. 37*). The

masseter is nicked at its anterior border, and the margins of mucous membrane are stitched to the deeper margins of the wound, as shown in *Fig. 38*.

Through the aperture thus created, the stay sutures are passed and the duct is gently pulled into the funnel-shaped extension of the oral cavity. The duct

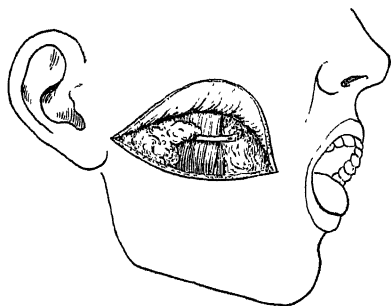


Fig. 36.

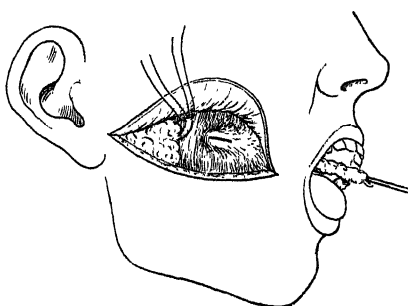


Fig. 37.

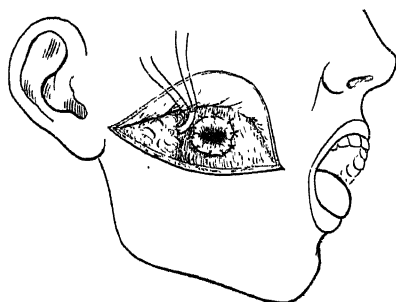


Fig. 38.

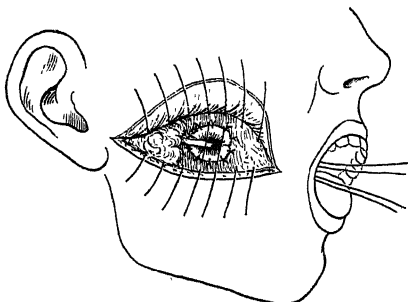


Fig. 39.

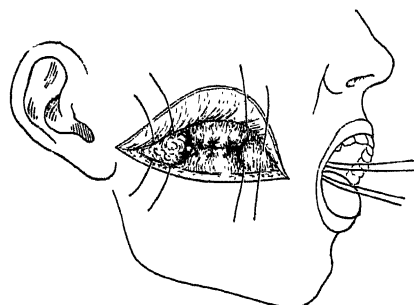


Fig. 40.

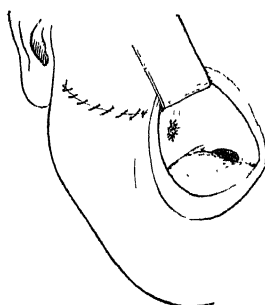


Fig. 41.

By kind permission of the Author.

is buried in the extension, and the extension cut off from communication with the exterior by catgut sutures passed as illustrated in *Figs. 39 and 40*. The skin wound is then sewn up, drainage being established through a small stab incision.

Each stay suture through the duct is then made to take a good hold of mucous membrane inside the mouth, and when tied the duct is secured in place (*Fig. 41*).

REFERENCES.—¹*Surg. Gyn. and Obst.* 1919, April, 404; ²*Brit. Med. Jour.* 1919, May 29; ³*Rev. Assoc. Med. Argent.* Buenos Aires, 1918, xxviii, 395; ⁴*Lancet* 1919, i, 971.

PEDICULOSIS. (*See also PYODERMIA.*) *E. Graham Little, M.D., F.R.C.P.*

Moore¹ conducted some remarkable personal experiments with *Pediculus corporis* reared in incubators, but originally derived from the clothing of men in a municipal lodging-house. He fed on his own person from 700 to 800 lice twice a day. Almost immediately a general tired feeling was noticed in the calf of the legs and along the shin bones, while on the soles of the feet and underneath the toes this tired feeling was so intense as often to prevent sleep until late in the night. An irritable and pessimistic state of mind developed. Seventeen days later an illness resulted with symptoms very similar to influenza, and a rash similar to German measles was present, particularly over the shoulders and abdomen. The experiment was intermitted for a few days, and when resumed the same result was noted. Later a third trial was made, this time with an increased number of lice, about 1800, with symptoms of increased illness. The experiment was then abandoned, and recovery, aided by a vacation in the open air, was immediate and complete within a fortnight. The author concludes from his experience that some cases at least of 'trench fever' may be simply intoxications with lice poisons.

Bacot² conducted experiments to demonstrate the reliability of **Sulphur Vapour** as a method of disinfection of clothes, and concludes that it is an unreliable procedure. Half an hour's exposure to a temperature of 55°, moist or dry Heat, is sufficient to achieve the purpose, and is much to be preferred.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, Nov. 2, 1481; ²*Brit. Med. Jour.* 1918, ii, 464.

PELLAGRA. (*See also DEFICIENCY DISEASES; VITAMINES.*)

Sir Leonard Rogers, M.D., F.R.S.

ETIOLOGY.—J. Goldberger, G. A. Wheeler, and E. Sydecostricker¹ have carefully studied the diet of Carolina textile mill communities in relation to the occurrence of pellagra. Seven villages of 300 to 800 people were investigated in the season preceding the annual occurrence of the disease, and divided into two non-pellagrous classes with higher and lower incomes, and two pellagrous classes, one with single cases and the other with two or more cases of the disease in the household. The most striking fact which resulted from elaborate analyses was that the food group comprising lean meats, milk, butter, cheese, and eggs, was very deficient in the two pellagrous groups as compared with the two which escaped the disease. The diets in all four groups were satisfactory as regards their total caloric contents. Carbohydrates were slightly less in the pellagrous groups. Water-soluble vitamins were only slightly less in the diseased groups, but the fat-soluble vitamins, especially those of milk and butter, were decidedly less, and this appears to be the essential factor in producing the disease. A fuller report of further studies is promised.

J. F. Siler, P. E. Garrison, and W. J. MacNeal, of the Thompson Pellagra Commission,² also record further studies of pellagra in South Carolina, and report that all new cases occurred while the patient was residing with or next door to an active pellagrin, and within six months of exposure to infection, and that the installation of a proper sewerage system almost entirely arrested the spread of the disease, thus supporting the infection theory of its origin. L. Nicholls,³ in view of his confirmation of Rogers' view that an oral streptococcus plays the most important part in the etiology of sprue, now suggests

that pellagra may be almost equally due to such an infection and some dietetic deficiency. [The writer in January, 1919, in his presidential address at the Indian Science Congress, also suggested examining pellagra cases for an oral streptococcal infection.—L. R.]

TREATMENT.—J. N. Roussel¹ reports favourably on the use of **Lemon-juice** in pellagra, the juice of three or four lemons daily working wonders. He regards pellagra as of scorbutic origin, due to the excessive use of tinned foods. Oranges had little effect.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, ii, 944; ²*Ibid.* 1919, i, 311; ³*Jour. Trop. Med. and Hyg.* 1919, Feb. 1, 21; ⁴*N. Orleans Med. and Surg. Jour.* 1918, Dec., 283.

Herbert French, M.D., F.R.C.P.

Recent observations point to pellagra being the result of deficiency in diet, thus bringing it into the same category as other better known deficiency diseases, such as beri-beri and scurvy.

A particularly careful experimental series is recorded by Goldberger,¹ and his work was gone over subsequently with the greatest care and scrutiny by special representatives sent from Johns Hopkins University, to investigate his results and report on them. These representatives were Dr. Vaughan and Dr. Welsh. Briefly, they were carried out in a large asylum housing about 4000 patients, and in all the wards there were cases of pellagra among both coloured and white patients when Goldberger started his work there. The only change he introduced was to add **Extra Animal Food**, with the result that pellagra disappeared wholly from the wards under his care, and persisted in all other wards. When the experiment was begun, Goldberger's wards contained a large number of pellagrins, all of whom recovered, and in none of them was there seasonal reappearance of the disease. From time to time patients were added to these wards, and within a few weeks they recovered completely, so far as pellagra was concerned, whilst in all other wards in which the additional animal food was not prescribed the disease persisted. After careful study Vaughan and Welch have become thoroughly convinced that Goldberger's contention that pellagra is a disease of malnutrition is correct. It is not claimed that the exact food constituents, the presence or absence of which determines the development of pellagra, have been discovered, but it seems clear that pellagra is caused by a diet poor in proteids, and may be wholly eradicated by proper feeding. Observations made on the Russian and Roumanian fronts, where pellagra occurred in some parts and not in others, bring out in a very striking way that where there was pellagra the chief article of diet was always maize. In equally poverty-stricken districts where the fundamental dietary article was black rye bread and beans, there was starvation, but not pellagra, and it seems certain that a dietary consisting mainly of maize or maize flour is in some way responsible for the causation of pellagra. As in the case of scurvy, there is a long latent period before the disease develops—months at least, and in some cases more than a year of the mainly maize diet is required.

In this connection, some interesting observations upon the effect of maize extract, and upon the effect of blood-serum from pellagrin patients upon maize-fed guinea-pigs, are reported by Volpino.² An extract of spoiled maize induced a severe and complex reaction in pellagra, but nothing of the kind was observed when extract of sound maize was used. The severe reaction seems to indicate that pellagrins are in a state of hypersensitization. This assumption is further supported by the fact that guinea-pigs fed exclusively on maize for twenty or thirty days, and then injected with blood from a pellagrin, died in twenty-four to forty-eight hours, whilst the blood from non-pellagrins does not affect

them. He reports another feature common to pellagrins and to maize-fed guinea-pigs, namely that their serum contains ferments which digest the proteins of maize. The hypersensitization to the extract of spoiled maize and the ferment-content of the serum fluctuate, according to Volpino, parallel to the manifestations of the pellagra, both practically disappearing as the patients recover from the pellagra; both are evident in a slighter degree in non-pellagrins who are habitual eaters of maize. He also used an **Aqueous Extract of Maize**, given in increasing doses, in the treatment of the disease, and reports enthusiastically on the results. Fourteen patients were thus treated, some of whom had been totally incapacitated by the recurrence of the pellagra. One prefers, however, Goldberger's much simpler treatment of curing the disease by adding more animal protein to the dietary, when circumstances render this possible.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, ii, 954; ²*Ibid.* 1919, i, 528.

PELVIC ORGANS AND APPENDICITIS. (See APPENDICITIS.)

PEMPHIGUS, ACUTE.

E. Graham Little, M.D., F.R.C.P.

Luithlen¹ describes two cases of acute pemphigus very fully. The first was in a butcher's assistant, age 21. He showed blisters on the scalp, chin, and forearm, without any inflammatory areola. There was considerable fever, general illness, and diarrhœa. The blisters spread to the axillæ and inguinal regions, and to the mucosa of the mouth (cheek and soft palate). There was a panaris of the right thumb, apparently the result of a wound from a mutton bone. Examination of the contents of a blister and of the blood from a vein showed abundant and pure cultures of streptococci, which were strongly pathogenic to animals and very hæmolytic. The following treatment was adopted. About 100 c.c. of blood was drawn from a vein, and on the next morning 20 c.c. of the Serum formed from this blood was injected intravenously, with the most sensational improvement—e.g., fall of temperature, arrest of new vesication, and healing of the old lesions, so that four days later only the thumb-whitlow and some vesicles on the elbow remained. The blood tested at this stage remained sterile. There was no recurrence of the eruption.

The second case occurred in a wagoner, age 17, and began with blisters of the size of nuts in the inguinal region, the upper thigh, and arms. The temperature rose to 40° C., and the patient was very ill, with diarrhœa and great weakness. Examination of the vesicles showed no organism, and the blood was also sterile, but the motions contained a dysenteric bacillus, a point which suggests to the author a diagnosis of toxic erythema bullosum. The urine had traces of albumin, but no excess of indican. Dilute Acetic Acid Lotions were applied locally as compresses, and within twenty-four hours the fever had dropped, the diarrhœa ceased, and the patient was greatly improved. Notwithstanding this improvement, an injection of 2½ c.c. of his own serum was injected intravenously. The patient, seen a month later, remained well.

REFERENCE.—¹*Wien. klin. Woch.* 1918, Dec. 5, 1297.

PERIPHERAL NERVES. (See NERVES, PERIPHERAL.)

PERNICIOUS ANÆMIA.

Blood Transfusion in (p. 4).

PERTUSSIS. (See WHOOPING-COUGH.)

PHAGEDÆNIC ULCER OF WARM CLIMATES. (See TROPICAL ULCER.)

PILES: INTERNAL HÆMORRHOIDS.*J. P. Lockhart-Mummery, F.R.C.S.*

Local anæsthesia has done much to overcome the objection that many patients had to an operation for piles. If the operation is performed under spinal or local anæsthesia with novocain, many of the unpleasant features of an operation are done away with. There is less after-pain, since there is no sickness to cause straining, and the unpleasant features of an anæsthetic are absent. There should be no severe pain after a pile operation, as the cause of it is sepsis in almost all cases, and this can be avoided by proper technique. It used to be the practice to stretch the sphincter thoroughly as a preliminary to a pile operation, but this is now recognized as quite unnecessary, and a potent cause of severe pain afterwards. With gentle handling and proper aseptic methods the pain should be practically negligible, and morphia should not be required.

A. A. Landsman,¹ in discussing the various operations for piles, concludes that the **Ligature Method** gives the best all-round results. This is also the conclusion of most English surgeons.

R. E. Farr,² in an article on local anæsthesia in relation to rectal surgery, advises deep infiltration of the anal area with a $\frac{1}{2}$ per cent novocain solution, the infiltration being carried to a depth of 3 to 4 inches all round the anus. A preparatory hypodermic injection of pantopon, gr. $\frac{1}{3}$, is given, and repeated once, to assist the local anæsthesia.

REFERENCES.—¹*Med. and Surg.* 1918, ii, 513; ²*Minnesota Med.* 1919, ii, 134.

PITYRIASIS ROSEA.*E. Graham Little, M.D., F.R.C.P.*

Damany¹ suggests that pityriasis rosea is a tuberculide, and meets the objection that recurrences are rare with the statement that these are not so rare as is contended, and cites two personal cases, one of recurrence after eight days, which he admits is of doubtful value as the interval was so short, and another after two years' interval, both attacks having been so diagnosed by competent dermatologists, but not by the same observer. More importance is to be attached to his contention that the glandular enlargements of pityriasis rosea are so constant and so considerable as to provoke comparison with the glandular enlargements of infantile tuberculosis. The author has seen the eruption associated three times with true tuberculoses of the skin, and four times with pulmonary tuberculosis, and several times in circumstances strongly suspicious of that explanation. Cutireactions and tuberculin reactions were positive in several instances in which no actual symptoms of tuberculosis were evident.

REFERENCE.—¹*Presse Méd.* 1919, March 10, 121.

PLEURISY.*Arthur Latham, M.D., F.R.C.P.*

TREATMENT.—In an article on **Auto-sero-therapy** in tuberculous pleurisy with effusion, Curtis Lyter¹ obtained results less satisfactory than those of previous observers, who reported immediate absorption in approximately 80 per cent of cases after the injection of a few cubic centimetres of the patient's own fluid into the subcutaneous tissues. Lyter's cases showed a percentage of 34 of absorption, and he holds that this was not a result of the treatment, but due to natural physical phenomena. He says: "The results indicate not only that the treatment does not cause absorption, accompanied by diuresis, diaphoresis, rise of temperature, and leucocytosis, but that in some cases it is not entirely devoid of deleterious effects upon the tuberculous process in the lung."

Maurizi² reports excellent results from injection of a suspension of 2 or 4 grm. of Iodoform in 10 or 20 grm. liquid petrolatum in the treatment of

tuberculous pleuritis. The iodine released slowly from the suspension kills the tubercle bacilli, and these in turn generate what amounts to an autotuberculin, while the absorption of the effusion is a kind of auto-sero-therapy. It begins with an exploratory puncture, but does not remove the effusion unless it is excessive in amount. There may be a febrile reaction, which reaches its height next day and lasts from five to seven days. Generally one injection answers the purpose. Maurizi keeps the patient on milk exclusively as long as the reaction is apparent. Surgical treatment is necessary with staphylococcus or streptococcus empyema, but it is contra-indicated for the tuberculous, for it does not cure the primary process, and is liable to set up associated infection and entail an incurable fistula. Capparoni uses glycerin instead of liquid petrolatum, but Maurizi found the glycerin too irritating.

Panto's³ routine practice in primary pleurisy with effusion is to aspirate from 80 to 100 c.c. of the effusion on alternate days, repeating three or four times, always at a different point; giving digitalis, sodium salicylate, and theobromine according to the indications; painting the chest wall with iodine; a light milk and egg diet, and during convalescence, the hypodermic injection of an Iodine and Iodide Solution (Durante's formula). The results have been highly satisfactory in the sixty cases he has treated by this method. The diuresis increased at once, the local relief in the chest was pronounced, and the fever rapidly subsided. The reaction to the mechanical irritation from the repeated puncture aids in the resorption of the effusion, until all is gone by the tenth or fifteenth day. The recovery is more rapid the earlier the punctures can be applied.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1918, Nov., 665; ²*Gaz. d. Osp. ed Clin.*, Milan, 1918, June 27, 507; ³*Ibid.* Aug. 4, 604.

PNEUMONIA. (*See also EMPYEMA; INFLUENZA.*)

Arthur Latham, M.D., F.R.C.P.

TREATMENT.—Elliot Dickson¹ lays stress on the enormous importance of rest in pneumonia, and considers that there are two essentials to successful treatment: (1) After the diagnosis has been made, the patient should be kept absolutely at Rest. He should not be allowed to sit up on any account, nor should he be allowed to turn himself in bed without assistance. (2) Tincture of *Strophanthus* should be given from the time the diagnosis is made, in sufficient doses to keep the pulse satisfactory. The exact dose varies with individual cases. Dickson begins with a full dose of 5 min. of the new B.P. tincture every four hours. If the frequency of the pulse increases to 120 per minute, the same dose is given every two hours, or even every hour if necessary. Tincture of capsicum, 2 min., is combined with each dose. The *strophanthus* should be of good quality, and it should be remembered that the active principle readily undergoes decomposition when the tincture is diluted with water. It should be prescribed as the tincture alone, and not made with water in bulk.

E. Feer² advocates the use of Camphor in the treatment of croupous and catarrhal pneumonia. In adults he advocates injecting 10 or 15 c.c. of the 20 per cent camphorated oil twice a day, or even more at need.

Lassance³ has treated 71 cases of lobar pneumonia, 3 cases of generalized pneumococcal infection, and 8 cases of bronchopneumonia, with the **Anti-pneumococcal Serum** of the Paris Pasteur Institute. As soon as the diagnosis was established, the patient was given an injection of 50 c.c., sometimes of 60 c.c., and even of 70 c.c. The following days the doses were reduced to 40, 30, and 20 c.c., until the second or third day after the temperature became normal, when they were discontinued. Lassance concludes that: (1) Antipneumococcal

serum diminishes the severity of the disease, distinctly shortens its average duration, improves the prognosis, and diminishes the mortality. The mortality among the 71 cases was 7·5 per cent, as compared with 12·9 per cent, the average mortality of lobar pneumonia in adults. (2) The serum mainly acts on the toxæmia and the general symptoms resulting therefrom, such as fever, headache, delirium, and restlessness, but has no influence on the mechanical complications caused by gross pulmonary lesions. (3) The serum has no effect on bronchopneumonia, in which the symptoms are chiefly caused by diffuse and deep-seated lesions of the respiratory system, and the pneumococcus is almost always associated with other micro-organisms, such as the streptococcus, staphylococcus, and *B. influenzae*, in which it has no action. (4) In addition to serum treatment, other therapeutic methods should be used.

Arthur Mathison⁴ advocates complete rest in bed, fluid diet, an efficient aperient, and the following prescription until the temperature is normal :—

R	Pot. Iod.	$\overline{3ij}$	Ext. Glycyrrh. Liq.	$\overline{3vj}$
	Creosoti	$\overline{3j}$	Aq.	ad $\overline{3vj}$
	Spt. Vini Rect.	$\overline{3iv}$		

Misce. One tablespoonful to be taken in as much water regularly day and night every four hours.

E. W. Martland⁵ speaks highly of the following mixture :—

R	Creosoti	$\overline{3ss}$	Ext. Glycyrrh. Liq.	$\overline{3ij}$
	Pot. Iod.	$\overline{3j}$	Aq.	$\overline{3vj}$
	Spt. Vini Rect.	$\overline{3ij}$		

Sig.—One tablespoonful every three hours until the temperature becomes normal.

See also pp. 11, 12.

REFERENCES.—¹*Brit. Med. Jour.* 1918, ii, 427; ²*Corresp.-Blatt. f. Schweiz. Aerzt.* 1918, Nov. 30, 1801; ³*Med. Supp. Rev. Foreign Press*, 1919, April, 175; ⁴*Brit. Med. Jour.* 1918, ii, 502; ⁵*Ibid.* 464.

PNEUMONIA IN CHILDHOOD.

Frederick Langmead, M.D., F.R.C.P.

Mary Putnam¹ has inquired into the influence of cerebral symptoms on prognosis. The total number of cases studied was 120, with a mortality of 26, or 21·6 per cent. Nineteen, or 16 per cent, presented early cerebral symptoms; of these, 2 died, and in 5 only of them was there evidence of tetany. Six cases suffered from late cerebral symptoms, with 4 deaths; and of these, 3 had pronounced pneumococcal meningitis. It is thus seen that late cerebral symptoms are of much more serious import than early ones, and that the mortality-rate in cases with early cerebral symptoms was decidedly lower than that in the disease in the children generally. Tetany could not be cited as a cause of the early cerebral manifestations in over 26 per cent, in contradiction to the dictum of Finkelstein, who holds that tetany is their invariable antecedent.

REFERENCE.—¹*Glasgow Med. Jour.* 1919, Feb., 84.

POISONING BY VARIOUS SUBSTANCES. (See also CAMPHORATED OIL, p. 6; DRUG ERUPTION; GAS POISONING.)

Herbert French, M.D., F.R.C.P.

The Treatment of Bichloride of Mercury Poisoning.—Death from acute bichloride of mercury poisoning occurs in the main either early, from shock and collapse, or later, from acute nephritis and enterocolitis, associated with anuria, uræmia, and acidosis. Rosenbloom,¹ and Weiss,² from their personal experiences, find that treatment devised for Combating the Acidosis saves a fair proportion of cases that would ordinarily have been regarded as hopeless.

Rosenbloom summarizes his treatment in detail as follows :—

Immediately the patient comes under observation, in addition to combating the collapse by hot bottles and hot blankets, administer the whites of three eggs beaten up in a quart of milk, and then empty the stomach by siphonage. Give by the mouth 300 c.c. of fresh **Calcium Sulphide Solution** containing 1 gr. of calcium sulphide to 1 oz. of water. Wash out the stomach with fresh calcium sulphide solution of the same strength. Administer in powder form 0.36 grm. of sodium phosphite and 0.24 grm. of sodium acetate ; or, if this is not available, give the following : sodium hypophosphite 1 grm., water 10 mls, hydrogen peroxide 5 mls ; use 10 times as much of the hypophosphite as poison taken. Give a copious lavage of the stomach after the above antidote, diluted 20 times, and then give the antidote undiluted every eight hours for two days. Pour through the stomach tube, after the above lavage, a solution of 3 oz. of sodium sulphate, 6 oz. of water containing 5 gr. of calcium sulphide, leaving this solution in the stomach. Venesect the patient to 60 c.c. of blood, and inject intravenously 800 c.c. of Fischer's solution, or of bicarbonate-glucose solution. Wash out the stomach morning and night, giving by the mouth after each washing 5 gr. of calcium sulphide dissolved in 3 oz. of water. Continue with lavage until the stomach washes are free from mercury when tested by Elliott's method, and until the urine is free from mercury. Give high colon irrigations of warm water morning and night, using 8 gallons of the water for each treatment. Give a hot pack twice daily. Give 8 oz. of milk every second hour. Give every second hour, alternating with the milk, 8 oz. of the following solution by the mouth : potassium bitartrate 1 dr., sodium citrate 1 dr., sucrose 1 dr., lactose 4 dr., lemon-juice 1 oz., boiled water 16 oz. Get the patient to drink as much as he can of the alkaline waters, such as Celestin's Vichy, or Kalak water. Give a low-fat and low-protein but high-carbohydrate diet for four weeks. Avoid salt in the food as far as possible, as it tends to increase the absorption of the mercury. Continuous protoclisis may be resorted to, using a solution containing 1 dr. of potassium acetate, 4 dr. of glucose, and 3 dr. of sodium bicarbonate to the ounce, and the urine should remain alkaline to the methyl-red test. Active treatment with a view to combating the acidosis may be required for as much as three weeks before recovery is complete. Weiss's technique is also based upon the administration of alkali, but differs in the technique of administration. He washes out the stomach with a mixture of 1 quart of milk and the whites of three eggs, following this by a saturated solution of sodium bicarbonate until the stomach washes return clear ; and before the stomach tube is removed, from 3 to 4 oz. of crystallized magnesium sulphate dissolved in from 6 to 8 oz. of water are poured down and allowed to remain in the stomach. A soapsuds enema is then given. His next step is to introduce **Alkali** by the mouth, by the rectum, and intravenously. As soon as possible after washing out the stomach, the patient is given Fischer's solution, consisting of crystallized sodium carbonate 10 grm., or 4.2 grm. of the ordinary dry salt, sodium chloride 15 grm., and distilled water 1000 c.c. From 1000 to 2000 c.c. of this solution are given intravenously at the first dose, and the alkaline medication is continued by giving imperial drink every two hours. This consists of cream of tartar 4 grm. (1 teaspoonful), sodium citrate 2 grm. ($\frac{1}{2}$ teaspoonful), sugar 2 grm. ($\frac{1}{3}$ teaspoonful), and water 240 c.c. (8 oz.), flavouring it with lemon- or orange-juice. The patient is urged to take large quantities of this. As an indication of the severity of the acid intoxication, and as a guide to the amount of alkali that needs to be given, Weiss relies on testing the urine. Except in suppression cases, which were rare in this series, the patient voids large quantities of urine, which should be rendered alkaline to methyl-red and kept so. If the output of urine is not maintained, and if

its reaction does not become alkaline to methyl-red after the first intravenous injection, a second intravenous injection is given the next day, and general alkali administration by mouth or rectum is continued. Under this treatment there is usually produced and maintained a free secretion of urine, and albuminuria, which usually appears early, disappears rapidly. Ordinarily two intravenous injections of the alkali, together with the solution of **Sodium Bitartrate** and **Sodium Citrate**, which is given at hourly or two-hourly intervals at night when the patient is not sleeping, were found sufficient to keep the urine alkaline and its amount normal; and most of Weiss's patients were discharged cured in about ten days. He lays great stress upon the need for adopting this active treatment at the earliest possible moment after the poison has been swallowed.

Poisoning by Carbon Monoxide. Brain Changes.—Acute carbon-monoxide poisoning is characterized by the typical cherry-red colour of the blood, and the demonstration spectroscopically of carboxyhaemoglobin in that blood, but this feature of the condition is applicable in diagnosis mainly during the first

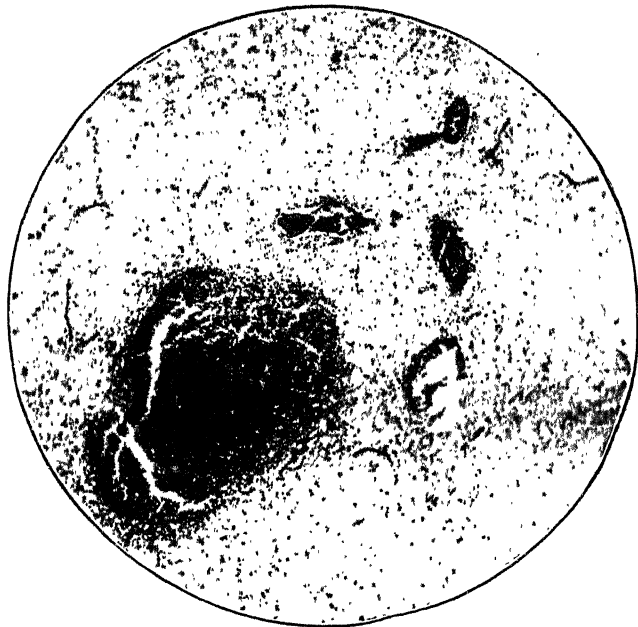


Fig. 42.—Hyperemia and hæmorrhage in white matter of brain in carbon-monoxide poisoning.

few days subsequent to the poisoning only. It has been shown by Hill, Semerak, and others³ that, in cases which ultimately die of the effects of carbon monoxide gas, but who have survived for more than a few days, one of the most characteristic lesions found post mortem is bilateral ischemic necrosis of the lenticular nucleus of the brain, especially the globus pallidus. This lesion results from a vascular disturbance brought about by the presence of carbon monoxide in the circulating blood, leading to thrombosis of minute cerebral vessels, accompanied by degeneration of the vessel walls, and the localization of the lesion apparently depends upon anatomical peculiarities. The necrosis varies from slight peri-

vascular lesions in the globus pallidus to gross visible softening of the entire lenticular nucleus and internal capsule. In addition to this, in severe cases there are scattered hæmorrhages in the leptomeninges and punctiform hæmorrhages throughout the white matter of the brain. The demonstration of these lesions in consecutive cases of carbon monoxide poisoning throws much light upon the nature of the nervous and mental disabilities that have been met with in non-fatal cases of carbon monoxide poisoning, and they probably have played some part in the explanation of the nervous phenomena that have resulted from the various kinds of gassing during the war. *Fig. 42* shows characteristic hyperæmia and hæmorrhage in the white matter of the brain, the result of carbon-monoxide poisoning, as seen under the low power.

Camphor Poisoning.—The most striking features of poisoning by camphor taken by the mouth are convulsive, though there may, in addition, be gastrointestinal phenomena. The convulsions may not come on for two or three hours after the patient has taken the camphor—perhaps in the form of camphorated oil, or linimentum camphoræ. Murdie⁴ describes a characteristic case in which the amount of camphor swallowed totalled about 200 gr. For the first three hours there was a little epigastric pain and giddiness, but no indication of any grave condition. Vomiting was induced, a purgative given, and the man seemed fit enough to be able to go to the nearest hospital. On the way he was taken faint and had to lean up against a railing; suddenly stiffened, gave a loud cry, and passed into a state of tonic convulsion. The whole of the muscles of the body became rigid, the chest tightly compressed, so that, as the residual air was expired, white froth appeared between the lips. The face became livid and swollen and the eyes upturned; the breathing was arrested completely, and the pulse became more and more feeble. In about half a minute the breathing returned in intermittent short gasps. The rigidity gradually relaxed, and in a few minutes the man passed from a comatose to a partly conscious state. He improved steadily, though for some hours afterwards he remained dazed. Notwithstanding the alarming character of the symptoms at one time, he made an uneventful recovery. The convulsion was entirely tonic in character, with no clonic movements beyond twitching of the neck and face muscles.

Poisoning by Nitrobenzene or Oil of Mirbane. Methæmoglobinæmia due to Shoe Dye.—Some remarkable cases of severe illness and extreme cyanosis developing rapidly in perfectly healthy men, without apparent cause, have been elucidated by Stifel,⁵ who personally met with sixteen successive cases in all of whom he traced the cause of an acute and alarming illness to the wearing of brown shoes or boots recently brought to the right tint by the use of a particular brown boot dye. It is interesting to note that merely wearing the shoes or boots, when they had been dyed recently with this material, caused the symptoms, and he verified this by actual experiments upon himself, and upon some volunteers, besides proving the toxicity of the shoe dye and its fatal effects upon mice. Stifel himself put on a pair of recently-dyed shoes, and within four hours of wearing them he began to feel nausea, headache, and visual disturbances; whereupon he removed the shoes, and did not venture further with his personal experiment. He then explained to two laboratory assistants the point he wished to test, and obtained two volunteers who developed symptoms of acute poisoning soon after beginning to wear the recently-dyed shoes. In one of them, for example, slight cyanosis set in six hours after the shoes were put on; in seven hours his lips and finger-nails were purple and he looked ghastly, but did not himself complain of much, except that his feet burned a little. It is the ghastly hue of the individual that attracts chief notice, and the rapidity with which the symptoms may come on when these recently-dyed

shoes are worn upon the feet is remarkable. If, after dyeing, they are left unused for a week, the symptoms do not develop. In the animal experiments it was found that eight drops of the shoe dye placed on cotton in a glass jar containing mice, killed the animals in from four to five hours. For a few minutes a mouse would not object to the odour of the dye; then it would grow restless and seek to escape; then it became dyspnoëic and drowsy, and finally unconscious. At necropsy the blood would be almost black, and show the presence of methæmoglobin to the spectroscope, although in the living human cyanosed patient methæmoglobin was not as a rule demonstrable spectroscopically. Further investigations of the shoe dye showed that the poisonous substance contained within it was nitrobenzene, also called nitrobenzol, or, in the trade, oil of mirbane.

Quinine Amblyopia.—In the course of studying several cases of quinine amblyopia, Traquair⁶ has found that the occurrence of this complication depends more on personal idiosyncrasy than upon the dosage of the drug. For amblyopia to ensue, the dose need not be excessive or even large. Big doses are naturally more likely to cause ill effects, but cases are on record in which amblyopia followed doses as small as 22 gr. in three days, 15 gr. in twenty-four hours, 12 gr. in one dose, and so on. It is of course hardly necessary to mention that enormously larger doses are quite commonly taken without harm, as instanced by the heroic treatment of many cases of malaria from the eastern seats of war. Idiosyncrasy evidently plays an important rôle, and it is not possible to state definitely what constitutes a dangerous dose of quinine. There is, however, evidence that an absolute or relative overdose may produce a state of increased susceptibility, and persons who have once suffered from quinine poisoning should use only minimal doses, or avoid the drug altogether.

Ground-glass Poisoning.—There is a widespread belief that the swallowing of ground glass is likely to be fatal in its results. Doubtless there is the liability to a particle of the glass perforating the bowel and leading to death from peritonitis; but over and above this there are many who have the impression that the swallowing of glass particles may prove fatal in some way apart from the occurrence of any perforation or peritonitis. Some deliberate experiments carried out by Simmons and von Glahn⁷ seem to prove that this notion is a myth. They deliberately fed animals with measured quantities of broken Petri dishes and test-tubes; the size of the glass particles thus administered being graded by means of sieves, and varying from "large broken to fine powdered". None of the animals suffered in any way from having quantities of broken or powdered glass thus administered by the mouth, and the authors were unable to demonstrate any microscopic lesions in any part of their alimentary canal or viscera.

Myrtol Poisoning. Eucalyptus Oil.—Myrtol is a derivative of certain myrtaceous plants and allied to eucalyptus oil, with which, or instead of which, it is used therapeutically for such conditions as fœtid bronchitis, or other septic infections of the bronchial tubes or lungs. Poisoning by myrtol or eucalyptus oil is not common, but Barker and Rowntree⁸ have collected 34 cases from the literature, and some of these were fatal. They point out that certain individuals have a remarkable idiosyncrasy to these drugs, the symptoms of intoxication occurring after therapeutic doses, or even less than therapeutic doses, such for instance as 3 minims of myrtol taken in capsule form three times a day. The symptoms which result are of two types—dermatological and neuropathic. The skin lesions are the rarer, but they may be of three types: firstly, a simple generalized erythema; secondly, an urticarial type with much itching; thirdly, a vesicular eruption amounting to a generalized acute dermatitis. These may or may not be associated with

nerve phenomena; and the latter may be very severe. In a few minutes or an hour or two after the ingestion of any of the myrtaceous derivatives, the susceptible patients may become seriously ill. They turn pale, become dyspnoeic and restless, and complain of headache, dizziness, twitching, and of pains in the chest and limbs. At first the intellect remains clear, but many of the patients presently become drowsy, feel dazed, and lose knowledge of the whereabouts of their extremities. If they try to walk they stagger about and fall. Sometimes there is a girdle sensation of constriction. Delirium may supervene in the severer intoxications, or convulsive seizures with coma, and pronounced symptoms of collapse, with tachycardia, a fall of blood-pressure, pallor, slight cyanosis, coldness of the extremities, diminished reflexes, and a subnormal temperature. Vomiting and diarrhoea are not constant, but vomiting should be induced if it does not occur spontaneously. The state of the bowels is inconstant. In most cases there is extreme myosis, but in less numerous cases equally marked mydriasis. Occasionally there is dysuria. The condition when severe may simulate opium poisoning, but there is nearly always absence of that stertorous breathing which comes on in the coma resulting from opium or morphia.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1919, i, 348; ²*Jour. Amer. Med. Assoc.* 1918, ii, 1045; ³*Ibid.* 644; ⁴*Med. Press and Circ.* 1919, Jan. 22, 60; ⁵*Jour. Amer. Med. Assoc.* 1919, i, 395; ⁶*Edin. Med. Jour.* 1919, March, 169; ⁷*Jour. Amer. Med. Assoc.* 1918, ii, 2127; ⁸*Bull. Johns Hop. Hosp.* 1918, Oct., 215.

POLYNEURITIS, ACUTE INFECTIVE.

J. Ramsay Hunt, M.D.

This affection, already described by Osler and Gordon Holmes, is the subject of an exhaustive study by Bradford, Bashford, and Wilson.¹ This account of the clinical manifestations of the disease is founded on the observation of a series of thirty cases.

Onset.—Two modes of onset may be recognized. In one, including the great majority of the cases, there is a definite history of an illness with general symptoms, prior to the onset of the palsy. In the second group, including but a small proportion of the total cases, the patients state that the first manifestation of illness is the actual development of the palsy. The most constant initial symptoms are moderate fever, headache, vomiting, and pain in the back. Sometimes general limb-pains, such as are associated with many febrile states, occur; occasionally sore throat may be complained of; and quite exceptionally there may be merely catarrh. In the rare instances when cerebrospinal meningitis is suspected, the headache and vomiting are accompanied by the doubtful presence of some stiffness of the neck. No rash has ever been observed.

Motor Paralysis.—The main characteristic of the motor paralysis may be shortly summarized as follows: The palsy is of sudden onset and widespread, affecting more especially the large muscles of the limbs and trunk, but not exclusively limited to them. The face is almost always affected, and generally on both sides. The palsy does not pick out individual muscles or groups of muscles, and hence the limbs and trunk are affected as a whole. Although the palsy is symmetrical, the degree of involvement of the two sides is not always equal. The palsy is practically always progressive in character, and it may conform to the ascending type. In some of the more severe cases of prolonged duration, general wasting of the limbs may be apparent during convalescence, and in one case only there was some atrophy of the muscles of the shoulder-girdle. No case with contracture or even with persistent disability from muscular atrophy has been seen. Some fibrillary twitching of the tongue and of the facial muscles has been seen, but quite exceptionally and never very pronounced. In some cases curious remissions in the degree of palsy present

may occur, so that an apparent improvement may take place one day, and subsequently this disappears and may even be replaced by increased weakness. This misleading and temporary improvement may be seen in cases that are severe and ultimately fatal.

Sensory Phenomena.—Although the most striking feature of the malady is the widespread and peculiar palsy, the disease is not one that affects the motor functions alone; sensation is also markedly and constantly affected. The numbness and tingling are felt in the parts subsequently involved in the palsy; but whereas the palsy affects more especially the proximal segments of the limbs, the numbness and tingling are felt especially at the periphery, e.g., the tips of the fingers and toes. When the face is involved, there is often numbness, or numbness and tingling, of the face, and also of the lips, at the onset of the palsy. Anæsthesia and analgesia are present, especially in the distal segments of the limbs. The sole of the foot is often affected, and very commonly the distribution of the sensory loss is of the glove or stocking type; but this is not always so, and it may involve areas on the arm or leg corresponding to the cutaneous distribution of the spinal roots, and these areas may be very symmetrical in opposite limbs. It is usual for the sensory loss to be incomplete, relative rather than absolute. Just as remissions in the severity of the palsy may occur, so also there may be similar remissions in the extent of the sensory loss, and the boundary line, separating the area of normal sensation on a limb from the area where sensation is diminished, may vary in position in one and the same case on different days.

Reflexes.—The so-called tendon reflexes of the type of the knee-jerk are lost in all cases where the declared disease has produced marked motor palsy and sensory loss; but if a case is seen and examined at the time of the onset of the palsy, the knee-jerk may still be brisk at a time when the muscular weakness is such that the patient is unable to stand without assistance. In such a case the knee-jerk is lost later, and generally within a few hours of the previous examination. In cases that are not only progressive, but also more or less of the ascending type, the ankle-jerk may be absent when the knee-jerk is still present. All the tendon reflexes, however, such as the ankle-, knee-, wrist-, and elbow-jerks, are soon lost and remain absent for a period of many weeks. The superficial reflexes vary; thus, the plantar reflex is usually lost, but the abdominal and cremasteric reflexes may be retained in cases where the involvement of the trunk is not very marked. The pupillary reflexes are not affected, and the pupil reacts normally both to light and accommodation.

Sphincters.—The functions of micturition and defecation are not profoundly affected in this malady, and even in the most severe and fatal cases they may remain normal up to the end. In a fair proportion of cases, however, there may be at some time, and more especially soon after the onset of the palsy, some temporary and slight retention of urine; such cases may require catheterization on one or two occasions.

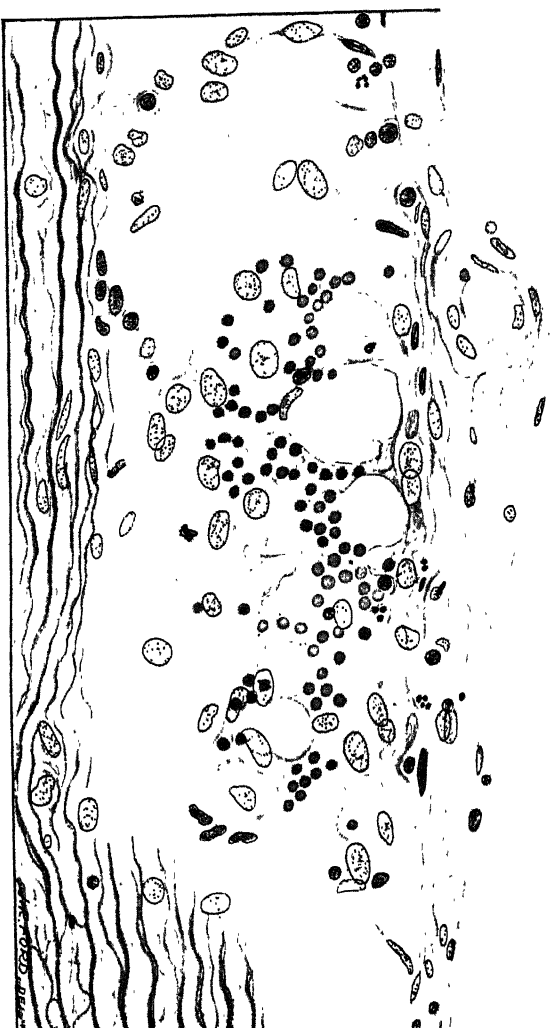
Cerebral Functions.—In one case the patient was rather drowsy and inclined to sleep unduly. No case with stupor, delirium, or convulsions has been observed, and, speaking generally, the special senses have not been affected. The patients always retain full consciousness, and this is so even in the fatal cases, where consciousness may remain until the end, as it is not uncommon for death to be sudden.

Cardiac Phenomena.—In a certain, but probably small, proportion of cases, some degree of tachycardia may be present both during the earlier stages of the palsy when fever is a symptom, and also later when pyrexia is absent.

Urine.—A small quantity of albumin is often present in the urine even when pyrexia is absent and no catheterization has taken place; but no clinical

PLATE XXX.

ACUTE INFECTIVE POLYNEURITIS (J. KEMSAV HEND)

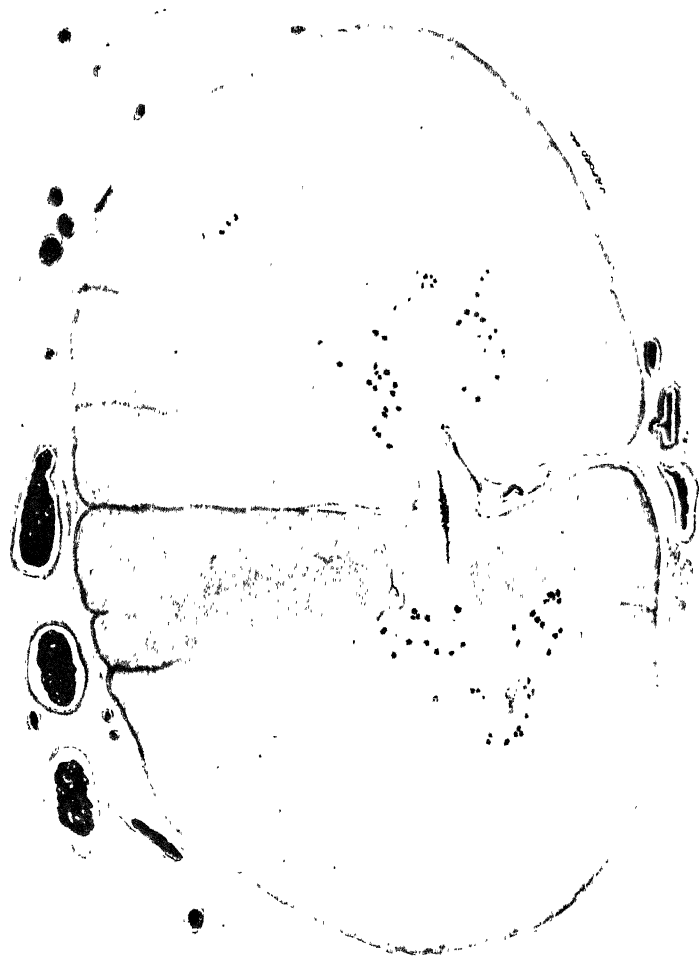


Acute neuritis (mm). Section from a series of the sciatic nerve to show increase in cells of Schwann, an inflammatory exudate with round cells, and hemorrhages between nerve-fibres.

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PLATE XXXI.

ACUTE INFECTIVE POLYNEURITIS—*continued*



Cord (mean), showing absence of infiltration of meninges. Divisions of pia mater by round cells as in acute anterior poliomyelitis, and also absence of such cells from around the vessels. Irregular petechial hemorrhages. Proliferation of ependymal cells of neural canal. Large perivascular spaces. The diffuse small-celled infiltration has been omitted for clearness.

PLATE XXXII.

ACUTE INFECTIVE POLYNEURITIS—*continued*

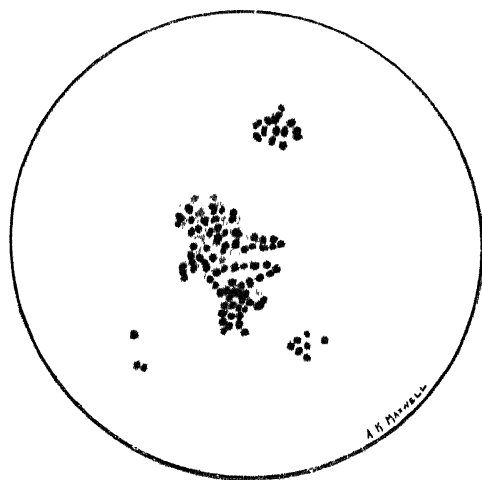


FIG. 1. A. H. HAYWARD. Nerve cross-section showing inflammatory cell infiltration.



FIG. 2. A. H. HAYWARD. Nerve cross-section showing inflammatory cell infiltration.

evidence of any appreciable nephritis, as shown by the presence of blood, casts, etc., has been obtained.

Blood.—A moderate leucocytosis is present during the early period of the paralytic stage of the disease. The number of white cells has varied between 12,500 and 19,000 per c.mm. in different cases.

Cerebrospinal Fluid.—This has been examined in four cases of lumbar puncture. In all cases the fluid has been quite limpid, free from cells, and no abnormality, not even an increased quantity under pressure, has been observed.

Relation of an Organism to the Disease.—An organism of definite microscopical and cultural character has been isolated from the nervous tissues of two fatal cases of polyneuritis, and also from four monkeys inoculated with emulsions of the spinal cord from three such cases. The cultivated organism, inoculated subdurally into a monkey, has reproduced the disease clinically and pathologically, and finally the organism has been recovered, post mortem, from the nervous tissues of the animal so inoculated. This organism is considered, therefore, to be the cause of polyneuritis.

The Relation of the Organism to the Globoid Bodies of Poliomyelitis.—This is of interest. Taking the subjects of morphology and staining reactions first, the two organisms show a similarity which is most striking. They are both very minute, rounded or oval, non-motile organisms which, when stained by suitable methods, show a characteristic differentiation into a deeply-stained excentrically-placed portion and a narrow faintly-stained margin. They show the same occasional formation of streptococcal and bacillary forms, and in their involution they follow the same course. Of the question of pathogenesis the difference between the two organisms is of the most significant kind. The organism isolated from cases of polyneuritis inoculated subdurally into monkeys produces a disease which is clinically and pathologically distinct from anterior poliomyelitis, a disease which is identical with that from which it was obtained. From a consideration of the above facts, it is suggested that the two organisms, while having a group relationship, are nevertheless distinct entities.

SUMMARY OF CLINICAL, PATHOLOGICAL, AND BACTERIOLOGICAL STUDIES.—

1. The so-called acute febrile polyneuritis is a very definite entity, capable of being separated clinically from other diseases of the nervous system.
2. It is a diffuse affection of the nervous system, affecting the spinal cord, spinal ganglia, and peripheral nerves, with but a slight incidence on the cortex.
3. The lesion is essentially one affecting the nerve elements, cells, and fibres.
4. The malady can be transmitted experimentally from man to the monkey, and the characteristic lesions reproduced in the experimental animal.
5. A living virus can be shown to be present, both in the human cases and in the inoculated monkeys.
6. The disease can be produced in the monkey by the suitable inoculation of the virus in pure culture, and the virus can be recovered from such experimental animal.
7. Consideration of the whole pathological processes would point to a septi-cæmia or systemic poison, which enters the central nervous system by way of the nerve trunks, both motor and sensory, and is probably of an infective nature. The lesions, while recalling and even resembling some features met with in the classical descriptions of those of acute or subacute anterior poliomyelitis, are clearly distinguishable from them, and raise the whole question of 'ascending paralysis' in the widest sense.

Plates XXX-XXXII illustrate the pathology, and are reproduced from the *Quarterly Journal of Medicine* by kind permission of the Delegates of the Clarendon Press.

REFERENCE.—¹*Quart. Jour. Med.* 1918, Oct., and 1919, Jan.

POMPHOLYX: DYSIDROSIS.*W. Graham Little, M.D., F.R.C.P.*

Of recent years there has been an increasing tendency, especially among American writers, to regard all cases of dysidrosis as due to a fungous infection, so that some authorities refuse to acknowledge the existence of an entity such as dysidrosis or pompholyx. Kambayashi¹ combats this view, and considers that there are really two types of clinical dysidrosis—that due to fungus, and that to unknown causes which he groups as idiopathic. The latter type shows no fungus even after careful examination, is more scaly and ill-defined in its contours, is intractable to antiseptic treatment (which is so successful in fungous infection), and is subject to recurrences. In the fungous type this author records results which are somewhat at variance with our Western experience, for the epidermophyton was quite rarely found by him, and notably in fifteen toe cases all were trichophytic.

REFERENCE.—¹*Jap. Zeit. f. Dermat. u. Urol.* 1919, Sept., xix, No. 9, 789.

PREGNANCY.*W. E. Fothergill, M.D.*

Abortion: Syphilis in relation to Abortion, Premature Birth, and Fœtal Abnormalities.—F. L. Adair¹ gives a careful analysis of 1095 women, who had 2773 pregnancies, of which 2422 ended at term. The Wassermann reaction was done 857 times, with negative results in 804 cases. The blood of the new-born was tested 393 times, with negative results in 381 cases. Adair writes that, in viewing the literature, suggestions are creeping in that syphilis is not such a common cause of abortion as is generally supposed. He finds that the relative frequency of abortion and miscarriage is not much greater in syphilitics than in non-syphilitics; but syphilis is the commonest single cause of premature births and still-births. Malformations are a little more frequent in children with luetic parents than in those who have not such parents.

Amongst his cases there were 109 who had 197 abortions in a total of 621 pregnancies, about 1 in 3; in the non-syphilitic and negative Wassermann group there were 83 cases with 142 abortions in 464 pregnancies, also about 1 in 3; 13 syphilitic cases had 23 abortions in 74 pregnancies, again about 1 in 3. Thus, during the first three months syphilis does not appear to be a potent cause of the interruption of pregnancy.

There were 40 cases who had 62 miscarriages in 202 pregnancies, or about 1 in 3; in 30 non-syphilitic cases there were 49 in 161 pregnancies, nearly 1 in 3; while in 7 syphilitic cases there were 10 in 27 pregnancies, a little over 1 in 3. Thus, syphilis is not responsible for a large proportion of interruptions of pregnancy during the second three months.

About one-third of the mothers who had premature children gave evidence of syphilis, and about 20 per cent of the premature infants were definitely luetic. About 10 per cent of the mothers who had still-born children, and about 12 per cent of the children born dead, were syphilitic.

There was a higher proportion of fetal malformations amongst the syphilitics; and the disease was proved to be present in 2 out of 5 cases of hæmorrhage of the new-born.

Ectopic Pregnancy.—N. S. Heaney² says that the chapter on ectopic gestation in many text-books should be rewritten. More attention should be given to the diagnosis of early unruptured cases. So much emphasis is placed upon rupture with rapid hæmorrhage, that unless a woman is in danger of her life, the possibility of ectopic pregnancy is not very likely to be considered. To emphasize the severity of the pain as a significant feature of ectopic pregnancy is like dwelling upon the importance of emaciation in diagnosing cancer of the uterus. The pain is often slight and is sometimes absent. Amenorrhœa is given too much importance. There is often only slight menstrual irregu-

larity, and sometimes none. Every patient with the symptoms of threatened, imminent, and incomplete abortion should be examined bimanually, with the possibility in mind that she may be a case of ectopic pregnancy. It is very rare indeed for amenorrhœa to persist. The more amenorrhœa, the greater the probability that the pregnancy is uterine and not ectopic. Another point generally over-emphasized is the passage of a decidual cast of the uterus as a signal of the death of the ectopic ovum. This is quite exceptional, for the decidua generally comes away in shreds and is not noticed. Vaginal bleeding, more or less profuse and irregular, is the general accompaniment of death of the ovum. The failure to obtain decidua by curetting does not exclude ectopic pregnancy, for the decidua may have been shed in fragments before the curetting is done. Enlargement of the uterus certainly occurs along with the development of the ectopic ovum, but this fact is too much emphasized. The more the uterus is enlarged, the greater the probability that the gestation is uterine, and *vice versa*. Nausea and breast symptoms do not as a rule have time to appear before an ectopic gestation goes wrong. Their absence is of no significance in diagnosis. It does not do to wait for shock, pallor, cold sweat, air hunger, and dullness of the flanks. The severity of the symptoms depends upon the amount of blood lost, not upon the fact that a tube is ruptured. If only small vessels have been torn, the patient will have sudden pain, not necessarily prostrating, followed perhaps by nausea and weakness. It is not always that she faints. If the bleeding stops, the patient may promptly recover and feel as usual. If a larger amount of blood is lost, she may become pale and ill. Only in extreme loss of blood would she show air hunger and abdominal distention. The absence of severe symptoms does not mean that she has not had an internal hæmorrhage. On the contrary, any woman of obstetric age who is seized with abdominal pain of severity followed by shock or syncope, even transient, must be regarded as a possible case of ectopic pregnancy. It is necessary to recognize cases of tubal abortion and tubal mole as well as cases of rupture with severe hæmorrhage. Heaney recommends exploratory vaginal incision in doubtful cases, and considers that a case which is serious enough to be in hospital under observation is serious enough to demand the completion of the diagnosis by this method, which is much more trivial than abdominal incision.

J. B. Hellier³ reviews just over 100 cases of ectopic pregnancy, which he has treated during nineteen years, in three groups according to the treatment. They formed 1·7 per cent of the in-patients treated. Expectant treatment was used 29 times (27 per cent). The diagnosis in these cases was based on abdominal pain of definite onset, menstrual irregularity, and the presence of a pelvic swelling. If, in such cases, there is no sign of continued internal hæmorrhage, it is permissible to keep the patient under observation. But the hæmatocele may become infected. Increase in the size of the swelling and signs of infection are signals for surgical intervention. Posterior colpotomy was used in 27 cases, in each of which there was a post-uterine hæmatoma. Blood, blood-clot, placental tissue, and in one case a tubal mole, were removed through the incision behind the cervix. The incision tends to close too soon, but this is prevented by passing a finger through it from time to time. Hellier is coming to prefer the abdominal route, because there was a tendency to the prolonged discharge of offensive seropus through the vaginal incision. One case in this group died of septic peritonitis, which was present on admission. Abdominal section was used in the other 52 cases, with 1 death from peritonitis. This group contained examples of most of the usual varieties of ectopic gestation. Hellier is impressed with the obscurity of the clinical history and the frequent absence of amenorrhœa. He notes that there is always vaginal

hemorrhage when there has been internal bleeding; that recurrent attacks of abdominal pain probably correspond to repeated internal bleedings; that the prognosis is favourable; that abdominal section must be promptly done whenever internal bleeding is still going on; that expectancy does not give good results when there is a large hæmatocele or one that remains unabsorbed for a long time; that diagnosis is difficult and is rarely to be expected before rupture. He remarks on the early end of most of these pregnancies, noting that in only 10 per cent of his cases was a recognizable fœtus discovered.

11. M. N. Wynne⁴ gives an elaborate analysis of the 303 examples of ectopic pregnancy that have been treated in the Johns Hopkins Hospital in the last twenty-seven years. They were only 1.3 per cent of the patients admitted to the gynecological service during that time. A correct diagnosis was made on admission in only 46 per cent. It was arrived at under anæsthesia in a few more cases, and the existence of the condition was frequently suspected. In 33 per cent extra-uterine pregnancy was not diagnosed at all. These figures show that the recognition of the condition is not so simple a matter as it is sometimes supposed to be. There were 13 deaths in the 303 cases, mainly due to hemorrhage and shock. The tables and figures in this careful paper prove the impressions of other observers to be substantially correct, though not supported by elaborate statistics. The analysis of the operations employed confirms the current practice, namely, abdominal section in the majority of cases; posterior colpotomy for a few cases of infected hæmatocele; expectancy for a few cases of early tubal mole and tubal abortion. [No doubt many of these do not seek advice, thus receiving expectant treatment without coming under observation.—W. B. F.]

Vomiting of Pregnancy.—J. W. Duncan and V. J. Harding⁵ regard a temporary lack of carbohydrate supply as that feature in the production of the vomiting of pregnancy which can most conveniently be countered. They have corrected the deficiency by administering **Glucose** or **Lactose**—mainly the latter—and have supplemented this by a **High Carbohydrate Diet**. In this way they have successfully treated 70 cases, 11 of which were of the severe pernicious type. Recovery was generally most rapid, especially in the mild cases—a matter of a few hours. In only two severe cases was there any return of the condition. After the initial stages of the treatment, the patients have been put upon high carbohydrate diet, fresh fruit and vegetables preponderating. The diet has not been severely limited, but excess in any one particular dish has been avoided, and also fat dishes. Butter, cream, pork, salmon, and the like have been forbidden. The bowel has been carefully cleansed in all cases. The details of treatment are given in the authors' own words as follows:—

1. Divide into three groups—mild, moderate, severe.
2. Daily routine examination of urine—total quantity, acetone reaction and its intensity, gravity, albumin, sugar, bile.
3. *Rest.*—Mild cases, limit demands of housekeeping, etc. Moderate cases, rest in bed. Severe cases, rest in bed with isolation.
4. *Excretion.*—Correct defects in functions of lung, skin, kidney, bowel.
5. *Diet.*—Mild and moderate cases, eliminate proteids and fats for forty-eight hours. Force carbohydrates, fruit, cereals, green fresh vegetables. Severe cases, absolute rest from all food by mouth first forty-eight hours. Begin carbohydrates as soon as patient may be able to retain them. To be given frequently and in small amounts.
6. *Medication.*—Mild cases, lactose solution 5 per cent, 1½ quarts daily by mouth. Moderate cases, lactose solution 5 to 10 per cent, 1½ quarts daily by mouth, if possible; when not retained, this solution may be

given by rectum, using a urethral catheter, giving very slowly 10 oz., and repeating every four hours. Severe cases, sterile glucose solution 5 per cent, 200 c.c. under each breast for one treatment, then use method of rectal injection. In both moderate and severe classes, the administration by mouth should be returned to as soon as possible.

7. When the nausea and vomiting are fully controlled, the amount of lactose per day may be reduced to 15 grm.; later, this may further be reduced to a 15-grm. dose tri-weekly. In all cases the reduction of the treatment or its discontinuance must be guided by an examination for acetone bodies in the urine. Lactose is preferably used because of its decided diuretic action.
8. Return to a diet mixed with proteid may be made as soon as the nausea and vomiting are under control, but a return to the fats must be slowly made.
9. Stomach lavage, mustard counter-irritation, sedatives, narcotics, may be used to relieve acute conditions and suffering, but are for obvious reasons to be avoided.

Influenza.—(See under that heading.)

REFERENCES.—¹*Amer. Jour. Obst.* 1918, Nov., 678; ²*Ibid.* July, 17; ³*Pract.* 1919, April, 169; ⁴*Johns Hop. Hosp. Bull.* 1919, Jan., 15; ⁵*Canad. Med. Quart.* 1918, Nov., 153.

PROSTATE, SURGERY OF.

J. W. Thomson Walker, M.B., F.R.C.S.

Brandsford Lewis¹ discusses the *preparatory and post-operative treatment in prostatectomy*. It is important, before the operation, to estimate the hæmoglobin percentage, blood-cell count, blood-pressure, phthalein output of the kidneys, and the quantity and amount of solids of the urine in twenty-four hours. Gross deviations from the normal in these should be corrected or improved before operating. He recommends proctoclysis by the drop method of 5 per cent **Sodium Bicarbonate Solution** for six hours daily. Efficient drainage is highly important before and after the operation. Interrupted catheterization does not provide this, and the catheter should be tied in the urethra. "Hæmoglobin above 60 per cent is favourable; 50 per cent is questionable; 40 per cent unfavourable; 30 per cent fatal, in connection with prostatectomy". While the phthalein output should be above 30 per cent for two hours to present a promising outlook, he holds that the requirements are not so rigid as with the hæmoglobin percentage. The author prefers the suprapubic operation, as it gives better results, and avoids certain sequelæ of the perineal operation such as ineffectual urinary control, sexual disability, and urethrorectal fistula. He advocates the two-stage operation as being safer. If the patient is vigorous, ether may be given; but if very old, debilitated, or septic, the first stage should be done by local anaesthesia, and a very transient gas- or ether anaesthesia, or preferably sacral anaesthesia, used for the second. The author looks upon spinal anaesthesia as the most dangerous of all methods: "My personal acquaintance with seven or eight instances in which death was attributable directly to spinal anaesthesia used by operators well versed in its technique has led me to this conclusion". Before the operation, **Digitalis**, **Diuretics**, plenty of fluids, and possibly **Pituitrin**, hypodermically, should be given. Too much purging should be avoided. "Between the first and second stage, an interval of one or two weeks, according to the state of the patient, should elapse. After the second operation, proctoclysis with 5 per cent sodium bicarbonate is commenced, and **Pituitrin** given every four hours".

Wright² discusses the question of performing a *two-stage suprapubic operation for prostatic hypertrophy*, and concludes that: (1) All cases, even where there

is a small amount of residual urine, should be given several days of preliminary drainage before prostatectomy is done; (2) Drainage by the in-lying catheter is better than suprapubic cystotomy, as the latter has been followed by death; (3) Cystotomy is reserved for cases where catheterization is impossible or where acute cystitis is present; (4) Catheterization or aspiration of the bladder should be carried out for several days before cystotomy is performed.

In recording a further series of 550 cases of total enucleation of the prostate, Freyer³ discusses the cases in which he recommends that the operation should be divided into two stages: (1) When the bladder is very septic, generally complicated by the presence of phosphatic calculi, and particularly when there is reason to believe that the kidneys are secondarily affected. (2) When, no catheter having been previously employed, there is frequent, painless dribbling of urine from an over-distended bladder, and there are symptoms of back pressure in the kidneys. (3) When rigors and pyrexia, followed by cystitis, set in after the introduction of a catheter for the first time. The catheter should be tied in, and if this is badly borne, the bladder should be opened suprapubically. Freyer does not favour the division of the operation into two stages except when absolutely necessary. He has performed the two-stage operation only in 73 out of 1550 prostatectomies (4.75 per cent). The age in Freyer's cases ranged from 48 to 90, the average age being 69, and the prostates removed weighed from $\frac{1}{2}$ oz. to 17 oz. The death-rate was $5\frac{1}{2}$ per cent.

Gardner⁴ advocates a two-stage operation, the first stage being carried out under local anæsthesia. The bladder is opened as high as possible, and a mushroom catheter introduced and held in place by a purse-string suture. Two days later the patient is allowed up. At the second operation, a general anæsthesia of ten minutes is sufficient. A Hagner bag is introduced to control hæmorrhage, and also a large drainage tube of the Marion type, both of which are removed at the end of forty-eight hours. The bottle pump designed by Bethune is then used for a week. A catheter is tied in the urethra for a few days to assist healing. The average suprapubic wound takes from three to four weeks to heal.

Soresi⁵ recommends a two-stage or three-stage suprapubic prostatectomy, the object being to reduce shock and prevent infection of the tissues surrounding the bladder, which he states often proves fatal. In the first stage the bladder is secured to the skin by a series of special sutures. In the second stage the bladder is opened, and, if considered advisable, the prostate is removed at this stage, or it may be deferred to a third one. In order to prevent hæmorrhage, a pear-shaped rubber bag with a urethral tube and a suprapubic tube is introduced by attaching the urethral tube to a catheter in the bladder, and drawing it along the urethra. The bag is then filled with mercury, which exerts an even pressure on all parts of the prostatic cavity, and also does not permit the bag to float up if urine collects in the bladder. A weight may be attached to the end of the urethral tube which projects from the meatus, and keeps the bag in place in restless patients.

Simons⁶ discusses the *factors determining mortality in prostatectomy*. There is great variation in published statistics, the mortality ranging from 3 to 22.5 per cent. The causes of death after prostatectomy are grouped thus: (1) Causes apparently unavoidable—pulmonary embolism, cerebral thrombosis or embolism; (2) Causes partly avoidable by pre-operative study and pre-operative preparation of the patient—renal insufficiency, urosepsis; (3) Causes partly avoidable by operative skill and methods—shock, hæmorrhage, pneumonia. The unavoidable causes do not account for the marked difference in the mortality figures. In order to reduce the mortality from renal insufficiency

and sepsis, careful pre-operative examination is necessary. The treatment of patients who are bad risks, and the question of a two-stage operation, are open to discussion. The author believes that this class of case can, with preparation, be done in one stage, provided that the preparation is thorough, and he believes that this method is as safe as the two-stage operation, and has advantages over it. The measures directed toward the avoidance of shock, hæmorrhage, and pneumonia are: (1) The cystotomy should be done under local anaesthesia, preferably with a rather high incision; (2) Speed during the cystotomy is undesirable; (3) The enucleation of the gland should be done under gas and oxygen, while ether should be avoided, and spinal anaesthesia is preferable; (4) In enucleation of the gland, speed and skill are very desirable, and materially diminish mortality.

Ochsner⁷ objects to the suprapubic operation of prostatectomy as giving unsatisfactory drainage and a long and exceedingly disagreeable period of healing of the wound. The *perineal operation employed by Young* is much more difficult, and takes much longer, but the drainage is satisfactory. The author removes the prostate by enucleating it by the finger from the perineum. The incision corresponds to that formerly used for lateral lithotomy, and is made on a grooved sound. The urethra is opened in the membranous portion, the finger introduced into the bladder, and the prostate enucleated, commencing in the urethra at the base of the gland, which is removed by the perineal wound. A double tube, one tube lying inside the other, is introduced, the inner tube draining the bladder, and the outer the prostatic cavity. The tube is removed two days after the operation. A hard fibrous gland is removed by gnawing away piecemeal under the guidance of the fingers with Ferguson's gnawing forceps. [This is a revival of an operation commonly done in this country before Frey introduced suprapubic prostatectomy. I have watched the late Mr. Reginald Harrison do it at St. Peter's Hospital. The operation was found to be impossible in a considerable proportion of cases, owing to the large size of the prostate or the depth of the perineum.—J. W. T. W.]

Watson⁸ has investigated the condition of the vesical sphincter after *perineal prostatectomy by Young's method* in 25 cases. He found that the internal or vesical sphincter returns to its normal tone in every instance within a few weeks of the operation. From clinical observation the function probably returns a few days after perineal prostatectomy, as there are periods of complete continence of three and four hours.

Martin⁹ describes a *method of siphoning the fluid from the bladder in suprapubic prostatectomy*. A large rubber tube reaches from the base of the bladder to an inch above the skin. Several small holes are cut in the tube near the bladder end, and one at the level of the skin. A large rubber catheter is pulled through this opening, and passes down the tube to within an inch of the bottom. As soon as the urine rises above the level where the catheter is inserted, a siphon action will be established, and the fluid will be drawn off the bladder.

According to Canovas,¹⁰ benefit from **X-ray Treatment** of the enlarged prostate can only be relied upon when the enlargement is of the glandular type. The size of the prostate may diminish under the influence of large doses of hard rays. He urges a course of this treatment in every case before operating on an enlarged prostate. Acute retention of urine may follow in sensitive prostates from too large a dose of the rays.

Ritter¹¹ has collected the literature, and records several cases, of *atrophy of the prostate*, or, as he names it, prostatic hypertrophy with a small prostate. The same symptoms may be produced by a small prostate of this nature as by an enlarged prostate. The condition is said to be due to a spasm of the internal sphincter. Ritter looks upon these cases as due to a ring of hypertrophied

prostatic tissue at the internal meatus, and finds that removal of the prostate, even if it is of small size, cures the condition.

Herbst¹² makes the following clinical classification of cases of *cancer of the prostate*: (1) A benign hypertrophy undergoing malignant degeneration. These tumours are as a rule readily enucleated, and only on being examined microscopically are they discovered to be malignant. This type is often benefited, and sometimes cured, by simple enucleation, or by excision as described by Young. (2) Tumours beginning as malignant growths at the lower part of the gland, and gradually spreading along the posterior part of the prostate to the seminal vesicles and ejaculatory ducts. These tumours are too advanced for radical removal, but the symptoms can be partly relieved, life prolonged, and the patient possibly cured by the judicious use of Radium applied by means of needles. (3) The surrounding tissues have become involved, metastases have developed, and there is a marked degree of anæmia and cachexia. This type is beyond any form of treatment other than bladder drainage to relieve retention. Herbst recommends the following method of treatment by radium. The bladder is opened suprapubically under local anæsthesia, and a bimanual examination made to define the limits of the tumour. By means of a needle-carrier, gold needles one inch in length, each containing 12 mgrm. of radium, are inserted into the tumour mass 1 cm. apart in different directions. The tumour is virtually converted into a pincushion. A silk guide which is attached to each needle is brought out of the suprapubic wound. The needles are left in place from twelve to fifteen hours, depending on how much of an exposure is desired, and are then withdrawn by the traction of the silk guides. One such exposure will usually cause removal of the upper part of the tumour. A second introduction of needles is made into the lower part of the gland, by making a dissection through the perineum and obtaining a complete exposure of the lower part of the prostatic mass. Five or six weeks should elapse between the two operations.

Diagnosis of prostatic calculi by X Rays (*p.* 25).

REFERENCES.—¹*Surg. Gyn. and Obst.* 1919, May, 469; ²*Ibid.* Jan., 56; ³*Brit. Med. Jour.* 1919, i, 121; ⁴*Jour. Amer. Med. Assoc.* 1918, Nov. 16, 1636; ⁵*N.Y. Med. Jour.* 1919, July 12, 51; ⁶*Interstate Med. Jour.* 1918, xxv, 469; ⁷*Surg. Gyn. and Obst.* 1919, July, 84; ⁸*Ibid.* June, 569; ⁹*Ibid.* Jan., 91; ¹⁰*Jour. Amer. Med. Assoc.* 1919, Aug. 9, 461; ¹¹*Deut. Zeit. f. Chir.* 1918, Nov., 180; ¹²*Jour. Amer. Med. Assoc.* 1919, May 31, 1610.

PRURITUS ANI.

J. P. Lockhart-Mummery, F.R.C.S.

W. A. Rolfe¹ advises Ionic Medication. He advocates a 2 per cent solution of Zinc Chloride in distilled water and Lugol's Solution of Iodine. The patient is placed in the right Sims position with legs well drawn up. The large felt-covered electrode, wet with a 3 per cent solution of sodium chloride, is slipped under the right buttock, and connected with either the negative or positive wire, according to whether a zinc or iodine solution is to be used. Cases showing a moist, macerated condition of the skin are treated for the first two or three times by the application of the active electrode well saturated with 2 per cent zinc solution, and connected with the positive or red cord. After two or three applications, which should last from 15 to 20 minutes, Lugol's solution of iodine is used, diluted with 4 parts of distilled water. This is applied with the negative pole, and continued in subsequent treatments in gradually increasing strength as the skin becomes more and more tolerant, until such time as the undiluted solution can be employed. As iodine ions penetrate deeper and at a faster rate than the zinc ions, the time of application can be reduced to about one-half that of the zinc solution. It is well to begin with a mild current of perhaps 2 or 3 ma., gradually increasing the amount until the

patient begins to complain of a warm sensation. Cases presenting a dry, thickened, parchment-like condition of the skin are treated from the beginning with diluted iodine solution, the strength of which is gradually increased in the manner already stated. The applications should be given at least twice weekly, and three times would be better unless the skin shows signs of irritation.

Dwight Murray,² in a further article on the **Vaccine Treatment** of pruritus ani, gives his experience with the treatment up to date. Out of 113 cases treated, distinct relief resulted in 99. He advises that cultures should be made direct from the affected skin round the anus, and from this a vaccine of dead bacteria is prepared. He advises starting with 3-minim doses into the buttock at two-day intervals, and gradually increasing the dose.

Hamburger³ advises dry powdered **Calomel** rubbed well into the parts in cases of old-standing pruritus ani.

[For the treatment of severe cases of pruritus ani, the operation originally described by the late Sir Charles Ball is the only method in the writer's experience that can be depended upon to give immediate and complete relief. It causes no damage of any kind to the parts, in experienced hands it is a perfectly safe procedure, and the results are immediate and permanent.—J. P. L.-M.]

REFERENCES.—¹*Boston Med. and Surg. Jour.* 1919, Aug. 14; ²*Jour. Amer. Med. Assoc.* 1918, Nov. 2; ³*Ibid.* Oct. 26, 1448.

PSORIASIS,

E. Graham Little, M.D., F.R.C.P.

Kyrle¹ confirms the opinion of Lipschutz, who found in histological sections of psoriatic lesions certain bodies in the cells and nuclei and plasma which are similar to those found also in chicken-pox, vaccinia, and variola, in molluscum contagiosum, and some other diseases. He regards these bodies as nucleoli derived from the nucleus, and considers the facts warrant the deduction that psoriasis is an infective disease, caused by a parasite of the nature of *Chlamydozoa*. He explains the circumstance that these bodies have not been noted before by the supposition that they are present only in certain stages, notably in the early phases of psoriasis when Kobner phenomena are present, i.e., the well-known characteristic that new psoriasis lesions can be provoked by scratching previously healthy skin in the course of active efflorescence in other parts.

Douglas Montgomery,² after a short trial of **Radium** in psoriasis, comes to the conclusion that it does not act as well as x rays, and in some instances indeed seems to increase the eruption.

Margosic Acid advocated (p. 10).

REFERENCES.—¹*Wien. klin. Woch.* 1918, July, 801; ²*Med. Rec.* 1918, Nov. 2, 765.

PSYCHOTHERAPEUTICS. (See also DRUG ADDICTION; HEART, IRRITABLE; MENTAL DISEASES; NEUROSES OF WAR).

Bedford Pierce, M.D., F.R.C.P.

Marguerite Wilson, M.B., Ch.B.

There is a tendency in recent articles on the treatment of nervous and mental disorders to exclude the term psycho-analysis. This is due to its association with the extreme views of psychopathology introduced by Freud. Few authorities consider that the source of hysterical symptoms can be traced entirely to sexual conflict or repressed desires of this nature. Fewer still trace the origin of the psychoneuroses exclusively to infantile sexual experiences. The extreme Freudian teaching, with its insistence on the importance of erotic tendencies in infancy and early childhood, is unacceptable to most modern authors. The word psycho-analysis with these associations is dropped, and phrases such as psychological investigation are substituted. Bernard Hart¹

considers that the term psycho-analysis should be restricted to the particular method introduced by Freud, as it involves a special theory of causation. Although many writers ignore the teaching of Freud, there is no doubt about the debt they owe to him. It is clear that psychogenetic factors are recognized as extremely important in the production of the neuroses and of the psychoses, and it is not denied that the origin of many nervous disorders goes back to early childhood. Moreover, everyone with experience must admit that repressed or perverted sexual desires are essential factors in a great number of cases. When it is remembered that the word sexual is used by Freud in a much wider sense than is customary in English-speaking countries, the divergence of view is not so great as may at first appear. It is too soon to appraise the true value of the Freudian theory, but his disciples may be pardoned if they draw attention to the extent to which his doctrines have permeated medical literature.

In the presidential address to the Royal Society of Medicine in the Section of Psychiatry, William McDougall² contrasts the new principles of clinical psychology with the teachings of the older schools. It is shown that the old doctrine of mechanistic psychology, with its stress of sensations, association of ideas, and the desire for pleasure, fails utterly to assist the student of mental disorders. Special reference is made to the work of Ziehen, Janet, and Mercier, who he considers fairly represent the many others who have vainly striven to bring mechanistic psychology to the aid of medicine. The newer school in which Freud was a pioneer, in spite of its limitations, is considered full of promise. Freud's chief contribution has been the insistence upon "two great allied facts: (1) The impulsive, demoniac, illogical nature of much of human thought and conduct; (2) The very partial and inadequate way in which consciousness or self-consciousness reflects or represents the workings of this impulsive force. These are the key-note of modern clinical psychology, but are marred by three great blemishes: the claim that he has established the principle of mechanistic determinism; the importance given to the 'pleasure principle' in influencing conduct; and, lastly, the introduction of a terminology which implies anthropomorphic agencies, the censor, the fore-conscious, etc." In spite of these defects, McDougall sees in Freud's work permanent contributions to psychology of special value in clinical medicine. These are: "(1) The conception of active continued repression of distressing memories; (2) The conception of conflict in the mind going on below the threshold of consciousness and capable of giving rise to disorder of thought and conduct; (3) The symbolical significance of some dreams and of some forms of waking thought, and the value of these as indications of conflict and repression; (4) The conception of the 'affect' as a quantity of energy that attaches to ideas and gives them their impulsive force in the determination of thought and conduct". Later workers have shown that there are other instinctive desires which influence conduct besides the sex impulse, and these frequently play as great if not a greater rôle in the production of the psychoneuroses. The instinct of self-assertion and its opposite of submission recognized by Adler, that of the herd-instinct by W. Trotter, and that of self-preservation and the allied instinct of fear emphasized by Boris Sidis, are among the primitive instinctive desires which are important in this connection; and it is probable there are fundamental impulses such as the desire for food which unconsciously influence our conduct and determine the symptoms exhibited in morbid states. McDougall proceeds to discuss the philosophical aspect of these problems, and states that among clinical psychologists there is a strong tendency "to believe that much of the development of the individual mind is literally a recapitulation of the racial mind, a gradual unfolding at the touch of experience of modes of thinking

and feeling and doing gradually acquired by generations of ancestors. Only by this assumption can they explain the striking uniformity of symptoms which characterize certain mental disorders, and the equally striking uniformity of thinking and feeling revealed by primitive myth and custom among the most diverse races of mankind".

McDougall concludes with a warning criticism that it is unsafe to assume that satisfactory clinical results are sound evidence of the truth of the psychological doctrines on which treatment has been based. "The whole history of medicine seems to me to show the danger and the fallacy of this claim. How many accepted therapeutic procedures have been shown to be worthless! How many others, whose value has been proved, have been founded upon, or held to prove the truth of, hypotheses which are for ever dead".

A careful review of the present teaching of this subject is also given in W. Aldren Turner's³ presidential address to the Neurological Section of the Royal Society of Medicine. In this the importance of psychological methods in the treatment of neuroses and certain forms of mental disorders is brought out. He states that the view is "generally accepted" that "the psychoneuroses and some of the psychoses are 'reactive' disorders—that is to say, they are reactions or responses to a failure of psychological adaptation or readjustment to environment. Associated and intimately blended with the process of readjustment is repression, usually of a painful emotion or instinctive tendency arising from conflict with antagonistic motives, such as honour, conscience, duty, or the traditional sentiments and ideals of society". A number of different reactions are discussed—hysterical, anxious, mental, epileptic—and the advantage of treatment by psychological methods explained. Light hypnosis is recommended as valuable in assisting in removal of amnesia and bringing into consciousness the painful and repressed emotion, but not to assist the patient to drive below the threshold of consciousness the distressing memories or experiences. "The recognition of functional amnesia is the key to the whole question of hysterical association. To permit of full recovery it is essential it should be cleared up, either by light hypnosis as a form of analysis, or by the longer process of psychological analysis".

In reference to the mental reactions, Aldren Turner maintains that many psychoses are due to failure of psychological adaptation. He states: "The doctrine of the psychogenic origin of mental disease is replacing the old materialistic physical or toxic view"; but at the same time he suggests some mental symptom-complexes may have both an organic and functional origin. Although the address deals with the psychogenic factors, the importance of investigating contributory physical causes is not overlooked, and mention is made of the influence of fever or other illness, fatigue, overwork, or trauma, all of which may make the patient "less able to repress or withstand the encroachment of morbid ideas and feelings of incompetency, unworthiness, and self-reproach".

This insistence on the two-fold nature of the problem is especially valuable. The modern literature of psychiatry is disfigured by the one-sided outlook of so many authors. It would seem as if there are an infinite series of cases, beginning with those in which the psychogenic factor is negligible, and ending with those in which it is all-important. At the end is the delirium of a person under an anæsthetic, or during fever, in which psychological investigation may explain the source of the rambling utterances, but can never demonstrate the nature of the toxic agent. At the other end may be placed obsessions or anxieties without any indication of a physical basis, which disappear when the repressed memories are understood and assimilated. Experience shows, however, that in the great bulk of cases the morbid mental symptoms

would not have appeared were it not for some disordered bodily function, and that effective treatment demands attention to both body and mind.

The methods of psychotherapy are discussed by Bernard Hart⁴ under the three headings, suggestion, persuasion, and analysis. In the first place the meanings and limitations of the term *suggestion* are explained. He would expound McDougall's definition into a "process of communication whereby a proposition is communicated by one person to another, and is accepted with conviction by the latter in absence of logically adequate grounds for its acceptance, and owing to the fact that conflicting processes which are or should be present are inhibited". He proceeds, "The therapeutic aim of suggestion is to implant in the mind of the patient a certain conviction, and this conviction generally consists in the firm belief that a symptom has disappeared or is about to disappear". *Persuasion* differs in that it is a purely logical process: "If persuasion is identical with rational thinking, it is clear that the superiority to suggestion which Dubois claims is based on very solid grounds, for rational thinking leads to knowledge, whereas suggestion leads only to beliefs erected upon an insecure foundation". Hart states, however, that in practice emotional disturbances only too frequently interfere with logical thinking, and the utility of Dubois' method of persuasion is severely limited. Dejerine's conception of persuasion is described as consisting of three elements: (1) Logical reasoning identical with the method of Dubois; (2) Suggestion in the sense already described, due to beneficial influence of one person on another; (3) The employment of the various elements of the patient's personality as weapons for achieving the therapeutic end. This involves the making use of the religion, ambition, affections in the patient's mind, a process used by all psychotherapists, and constituting a most powerful and efficient means of destroying or moulding into other forms the mental processes responsible for the symptoms. *Analysis* is any method whereby the nature and the relationship of the causes producing the patient's condition are determined, and the condition removed by the re-arrangement and adjustment of these causes. It assumes that certain nervous and mental disorders are of psychogenic origin, and that treatment should aim at elucidating the chain of causes. How far the various types of insanity can be included in the psychogenic group is as yet uncertain; but as regards the psychoneuroses, the view that they are essentially psychogenic is "now accepted by almost every authority in every country". "These three principles can be clearly distinguished theoretically, but in actual practice more than one principle is almost inevitably employed. Every psychotherapist, although he may style himself suggestionist, persuasionist, or analyst, makes use of at least two and often all three principles. Suggestion and persuasion by themselves have but a limited field of application: they are only capable of dealing with symptoms. . . Affective therapeutics other than suggestion in the narrow sense, has a wider application, but its use as an accurate weapon presupposes a preliminary analysis. Analysis is the ideal method, but is more properly a stage in treatment than a method complete in itself. By its employment the various causal factors responsible for the disordered condition are elucidated; but when this has been achieved, there remains the further task of re-arranging or eliminating these causal factors, and in this latter process persuasion and affective therapeutics are probably invariably called into play".

Margaret J. Hamilton⁵ urges the importance of psychological analysis as opposed to the psycho-analysis of Freud (psychological analysis means a careful and detailed analysis of the patient's conscious and unconscious mental life). This is a means of discovering the presence of emotional biases and inhibitions. These are dealt with effectively, and this generally means the moral reconstruction of the individual. The term moral is used in its widest sense, and

means a "healthful unity of the competing instincts and impulses, an adjustment of the individual to his social environment, a harmony of his instincts one with another, a robust and straightforward honest dealing with the facts of both the internal and external life, which makes possible the resolution of the harmful conflicts and repressions, and free the mind for its most healthful and efficient functioning intellectually". During this reconstruction the patient is shown as rapidly as he is able to face "the ideas, feelings, and general attitudes of mind that are interfering with his ongoing, and a programme of thought and action to correct these is mapped out for him". This re-education must go hand in hand with the analysis.

Brill⁶ urges that it must never be forgotten that this form of treatment is not suitable for acute forms of neurosis. The cases chosen for this treatment should be persons of normal intelligence and good character, in whom the acute attack has passed. The patients who do best are chronic psychoneurotics of normal mental make-up. Profound hysterics and cases of compulsion neuroses also do well. There is a general consensus of opinion that psycho-analysis is useless and often actually harmful in dementia præcox. Oberndorff⁷ points out its dangers in the active depressive stage of cases of the manic-depressive type, when, instead of relieving the symptoms, it actually adds to the patient's sufferings. Onuf⁸ quotes a case of dementia præcox in which a series of attempts at suicide were made after certain facts had been revealed. Frink⁹ considers psycho-analysis very disappointing in alcoholism. He states he has never yet been able to finish the analysis of an alcoholic; whenever a certain point was reached the patient got drunk, and this went on indefinitely. Brill⁶ has been more successful, but says he has always found chronic alcoholics more or less deficient mentally, and whenever he succeeded in curing the alcoholism something worse took its place. He considers chronic cases of all kinds which have resisted other forms of treatment suitable for psycho-analysis.

The value of *hypnotic suggestion* in the treatment of certain psychoses was illustrated by Jeffrey,¹⁰ in recounting the case of a young girl, age 20, who at first was depressed and afterwards became emotional and confused. The more grave symptoms immediately followed a dream in which the sun and moon came into collision, and there was poured out a deluge of blood in which she and the whole world was to be submerged. She awaked in a state of fear, and was convinced she was on the brink of a great catastrophe. Hypnosis was used as an aid to suggestion, and soon a light sleep ensued, when she was able to answer questions and listen to suggestions. Her condition was fully explained to her, and she was told that her misery and strange thoughts were due to her dream. After further hypnosis she slept for five hours, and in the morning was calm and composed. She was discharged five days after admission, although the illness had lasted seven months. Replying to criticisms made during the discussion which followed the paper, Jeffrey said he considered the case one of anxiety neurosis; he was satisfied this case had no sexual explanation, and that the dream could not bear this interpretation.

William Brown¹¹ has investigated and treated 5000 cases of psychoneuroses in France and elsewhere. He finds in early cases that during light hypnosis, dissociated memories with accompanying sensations of fear, etc., are revived, and this results in an amelioration of the symptoms. No suggestion was used. The more chronic psychoneuroses do not respond in this way. He does not regard light hypnosis as a panacea for all mental ills, and considers it necessary only in a "minority of nerve cases, and in these it should be used sparingly".

REFERENCES.—¹*Proc. Roy. Soc. Med. (Psych. Sect.)*, 1918, Dec., xii, No. 2, 26; ²*Ibid.* 1; ³*Ibid.* (Neurol. Sect.), 1919, Nov., 1; ⁴*Ibid.* 13; ⁵*Jour. Abnorm. Psychol.* No. 6; ⁶*Arch. Neurol. and Psychiat.* (Meeting of N.Y. Neurol. Soc.), ii, No. 2; ⁷⁸⁹*Ibid.*; ¹⁰*Jour. Mental Sci.* 1919, Oct., 258, 284; ¹¹*Brit. Med. Jour.* 1919, i, 633.

PULMONARY GANGRENE. (*See LUNGS, GANGRENE OF.*)

PULMONARY TUBERCULOSIS. (*See TUBERCULOSIS, PULMONARY.*)

PUNCTURE FLUIDS.

Oskar C. Gruner, M.D.

Gloyne¹ gives a useful survey of the utility of the laboratory investigation of thoracic puncture-fluids. In collecting the samples, it is well (1) not to use antiseptics for sterilizing the syringe, (2) to have the needle and syringe lined with a film of citrated saline, (3) to run two volumes of fluid at once into a sterile test-tube containing one volume of citrated saline. This observer makes much use of cell-counts, bacteriological examination, and the precipitin immunological test for tuberculosis. Each mode of study culminates in a diagnosis of the bacteriological factor. Either tubercle bacilli are found readily (pyopneumothorax: usually due to pulmonary tuberculosis: 56 per cent of film-examinations positive for tubercle bacilli); or, when they are not found readily (simple effusions: cell-content chiefly small round cells: 25.7 per cent of successes in direct smear preparations), the precipitin test may be applied and the minor data may be taken into consideration in order to determine probabilities or not for tuberculosis. Further, the detection of secondary infections comes to be of importance for prognosis. Such infections were found in 18.2 per cent of cases of pyopneumothorax, 11.1 per cent of serous effusions with pneumothorax, and in no cases of simple tuberculous effusion.

The value of bacteriological examination is shown in the case of empyemata, for which the following tabulation contains a valuable summary (Gloyne's results are added to the table given in his paper).

BACTERIOLOGICAL FINDINGS IN EMPYEMATA.

Authors	Total No. of cases	Streptococci	Pneumococci	Staphylococci	Tubercle bacilli	Other organisms	Mixed infections	Sterile	Organisms not recorded
Gee and Horder*(St. Bart's.)	32	20	75	—	—	—	—	—	5
F. T. Lord†	137	20.4	39.4	3.6	—	2.4	16	18.2	—
Holt and Howland‡ (Babies' Hosp., New York)	115	14.4	64	7.8	0.5	0.5	12.8	—	—
S. R. Gloyne ..	33	12	58	12	—	—	12	—	6
	317	16.7	53.8	5.6	0.1	1.4	12.9	7.8	1.5

* Allbutt and Rolleston's *System of Medicine*, 1912. † Osler and Marmes's *System of Medicine*, 1915. ‡ *Diseases of Infancy and Childhood*, 1917.

Ballin² describes the naked-eye characters of the pus in streptococcal empyema as a thin grey-red fluid containing small flakes, while in influenzal empyema it is thick, purulent, and sometimes contains thick fibrinous masses which will not pass through the trocar.

Hirschfeld³ uses a macroscopic oxydase reaction in order to detect the presence of pus, not only in pleural fluids, but also in ascitic and other body fluids. The fluid is covered with the mixed reagents, and a blue colour appears which will pass into amyl alcohol. The reagents are 1 per cent aqueous dimethyl-p-phenylenediamine; 1 per cent α -naphthol in 70 per cent alcohol or 1 per cent potash. Reisz⁴ draws attention to the iodophil substance in leucocytes in pus as a sign of the stage of a suppurating process. He does not consider the granules so revealed are of the nature of glycogen. His work is

in connection with gonorrhœal pus, and may well be applied to the study of other kinds of pus. The position of the granules in the leucocytes—whether near to the nucleus or round the periphery of the cell—is of importance, and also whether such granules are present at all. The less iodophil substance, the nearer is the case to resolution. The presence of eosinophils in pus is also of interest in a similar connection. Eosinophilia is evidence of a particular kind of toxæmia (Grégoire and Courcoux, quoted by Gloyne,¹ v. Korcasynski,⁵ and others).

REFERENCES.—¹*Lancet*, 1919, i, 935; ²*Jour. Amer. Med. Assoc.* 1919, lxxii, 335; ³*Deut. med. Woch.* 1917, No. 52; ⁴*Arch. f. Dermatol. Syph.* cxxiii, 815; ⁵*Wien. klin. Woch.* 1917, No. 41.

PURPURA HÆMORRHAGICA.

E. Graham Little, M.D., F.R.C.P.

Von Waldheim¹ describes a papular and pustular form of purpura occurring in persons suffering from prolonged lack of food, or subsistence on the so-called substitutes. Scorbutic symptoms were present in several instances, and if fresh food could be supplied the patients usually got well. It seems, however, to have been a fairly fatal symptom, as 72 died out of 159 cases. In three the suprarenals were the seat of hæmorrhages.

REFERENCE.—¹*Med. Supp. Rev. Foreign Press*, 1919, April, 177.

PYLORIC STENOSIS IN INFANTS.

Frederick Langmead, M.D., F.R.C.P.

The symptoms and signs of this condition are now well known. Difference of opinion still remains upon two main points, one diagnostic, the other of treatment.

DIAGNOSIS.—Some authorities hold that pyloric stenosis is far less common than records would suggest, and that the condition is diagnosed too readily. At a recent meeting of the Medical Society of London, E. Cautley¹ voiced this opinion. He is not satisfied with a diagnosis of pyloric stenosis unless a tumour can be felt distinctly. Cases of so-called recovery under medical treatment only are not in his opinion genuine, and many of them are examples of mucous catarrh of the stomach.

That pyloric spasm and pyloric stenosis are distinct conditions is a view which is losing ground, for when there are the characteristic symptoms of explosive vomiting, constipation, and wasting, dating from a few days or weeks after birth, and a true and vigorous gastric peristalsis is visible, a tumour can almost always be felt under anæsthesia, and operation or fatality proves the presence of the pyloric narrowing and hypertrophy of the circular pyloric muscle.

TREATMENT.—Whether treatment should be medical or surgical, and if the latter the optimum time for operation, are matters of controversy. In the discussion referred to, A. F. Voelcker² said he had had under his care 33 cases. The careful analysis he had made of them did not indicate what were the causes of death or what determined the degree of wasting. The mortality had been 60 per cent, and no case had been treated surgically. He saw no reason to believe that the pyloric obstruction is the cause of death, and until the surgical results improved he did not favour operative procedure.

There is little doubt, however, that **Surgical Treatment** is becoming more frequently employed. The writer³ expressed the view that operation is not always necessary or indicated, for many mild cases lose all symptoms on medical treatment alone, and afterwards remain in good health. On the other hand, surgical aid should be invoked without delay in the severest cases, where the infant is already much wasted and puny, for any delay may prove fatal. It is in cases of moderate severity that the selection of treatment is the most difficult; but delay is not so serious, and medical treatment may

first be given a trial. If loss of weight continues after one or two weeks, no further delay in calling for surgical treatment is safe, and, if the loss of weight is rapid, even this delay is dangerous. On the other hand, a few days' medical treatment may show that it can be given a more extended trial, with a good chance of ultimate recovery.

Medical Methods.—The accepted medical treatment is by **Careful Dieting** with frequent small digestible feeds, and **Gastric Lavage** once or twice a day according to the amount of mucus and curd which comes away in the fluid used, and the amount of vomiting. There appears to be no food which suits all the infants, but many physicians favour small quantities of **Peptonized Milk**. In a recent number of the *Archives of Pediatrics*⁴ there is an account of 12 cases which were treated by slow feeding with thick farina, a cereal food containing a good deal of starch. The principle involved is that the thickness of the mixture prevents regurgitation and gradually overcomes the spasm of the pyloric sphincter. In 11 of the cases the vomiting ceased shortly after the adoption of the diet, although in most cases the peristaltic waves and the tumour persisted for weeks or months after vomiting ceased. Weight began to increase immediately. [Was this from the weight of the diet?—F. L.] One patient failed to improve until operated upon. The disadvantage of the method is the extreme constipation produced. Unaltered starch appears in the stools.

In breast-fed infants the writer has found that the device of restricting the feeds to five minutes hourly, and thereafter emptying the breast by a breast-pump, sometimes leads to prompt improvement.

Surgical Methods.—Many measures have been used to make the pylorus more patulous, but until recently gastro-enterostomy was the operation usually performed. The results, however, have been considerably improved by the adoption of the **Rammstedt Operation**, which consists merely in splitting the circular muscle by a longitudinal incision along the anterior aspect of the pylorus, and leaving the mucous membrane untouched. Downes reduced the mortality in his operative cases from 43 to 24 per cent when he replaced gastro-enterostomy by the Rammstedt operation. C. G. Kerley⁵ reports the cases of 26 patients, met with in private practice and treated by this means, of whom 4 died; in 17 there was no post-operative vomiting. One vomited twenty-two times and one nine times, the remaining 7 to a less extent. A temperature above 101° was noted in 7 cases after operation. In one it was 104·8° and in one 103°, but all seven recovered. In his view a low mortality depends upon early diagnosis and immediate operation. This does not mean that a child with a palpable tumour cannot recover without operation. The surgical risk depends in a large measure on the duration of the vomiting.

F. O. Allen⁶ has performed Rammstedt's operation 8 times, with 2 deaths, one from hæmorrhage. In the case of the other, the child, a girl two months old, had vomited since the second week and was in a very poor condition. The operation has been slow in obtaining recognition in this country, but R. A. Ramsay⁷ records 3 cases. All recovered from the effects of the operation and gave evidence of patency of the pylorus, but 2 died, one after six days from mal-assimilation, and one after four and a half weeks from ileocolitis. H. Tyrrell Gray⁸ has performed Rammstedt's operation in from 15 to 20 cases, and agrees that it is the best surgical procedure.

Post-operative Management.—The importance of this equals that of operation. The procedure advised by L. Emmett Holt and W. L. Downes is as follows: The child is wrapped in a warm blanket before leaving the operating-room, and when in bed is surrounded by hot-water bottles outside the blanket. For an hour or two the head of the bed is kept low to prevent aspiration of mucus

into the larynx. When nourishment is begun, the head of the bed is raised to the horizontal position. About ten or twelve hours later the patient is placed in a semi-erect position, which prevents regurgitation of food and permits easy escape of gas. As soon as the patient is placed in bed, 120 c.c. of saline is injected subcutaneously and, if the condition is poor, 5 min. of **Epinephrin** (1-1000) is also injected, and repeated in from four to five hours. **Dilute Whisky**, 5 min. every three hours for the first five or six days, has proved of great value. Transfusion in a few cases of collapse has been of material benefit, from 80 to 120 c.c. of blood from either parent being utilized. One and a half hours after operation, provided that the patient has sufficiently recovered from the anæsthetic, 10 c.c. of water are given, and an hour and a half later 4 c.c. of barley-water and 4 c.c. of breast-milk. Two hours later 8 c.c. of breast-milk and 4 c.c. of barley-water are given. Thereafter breast-milk every three hours, alternated with water and gradually increased in amount, so that at the end of forty-eight hours about 30 c.c. are given at a meal, with 4 c.c. of barley-water. The barley-water is then discontinued, and on each successive day the amount of milk permitted is increased by 5 c.c. at a feeding, so that by the eighth day the patient is having 60 c.c. every three hours. On the third day, the intervals at night are lengthened to four hours, so that seven feedings are given instead of eight. By the time the baby is taking 60 c.c. of breast-milk at a feed he may be put to the breast once. The baby is weighed before the nursing, and at intervals of three minutes until he has taken 60 c.c. from the breast. The following day three nursings are allowed, so that by the eleventh or twelfth day the patient is breast-fed entirely, and can leave the hospital. Measurement of food during nursing must be continued for another week by weighing carefully before and after. For a month or longer a wet-nurse is advisable if the mother is not available. In well-nourished infants, a sponge-bath is given daily until the wound is healed. In emaciated children, an oil-rub is preferable until any tendency to a subnormal temperature is over.

In cases of vomiting due to accumulation of gas in the stomach, the child should be raised to an upright position after feeding. If this does not suffice, a soft rubber catheter may be introduced into the stomach before each meal. If still persistent, **Gastric Lavage** may be employed. One teaspoonful of castor oil is usually given twenty-four hours after operation if the bowels have not been opened. There should be from two to three stools daily. If they are more frequent, protein-milk is substituted for three or four breast-feedings. The wound is covered by a narrow fold of sterile gauze, held in position by strapping, and is not ordinarily disturbed for four or five days. The stitches are removed on the ninth or tenth day.

REFERENCES.—¹*Lancet*, 1919, i, 380; ²*Ibid.*; ³*Ibid.*; ⁴Quoted in *Med. Press and Circ.* 1919, i, 81; ⁵*Jour. Amer. Med. Assoc.* 1919, Jan. 4, 16; ⁶*Ann. Surg.* 1919, May, 531; ⁷*Lancet*, 1919, i, 380; ⁸*Ibid.*

PYODERMIA, (See also PEDICULOSIS; SCABIES.)

E. Graham Little, M.D., F.R.C.P.

Semon and Barber¹ contribute an important paper on their joint experience of pyoderma in Army practice in the War. In their experience of 669 cases of skin disease admitted into a certain hospital, 631 were classified as pyodermias, and of these, 442 were the result of scabies and pediculosis, 112 of seborrhœa. The treatment of scabies in the Army was very fully dealt with in the *ANNUAL* last year, to which readers are referred. The pus infections of pediculosis are very important complications, and vary from a superficial pustule, the immediate result of the bite, and occurring *in situ*, to a deep-seated boil. Very common lesions are superficial gutter-like ulcerations, the

product of infected scratch-marks. Pigmentation and scars may be left by these lesions. The authors insist especially on the necessity of clearing the body of ova as well as of parasites, and they have established the fact that the ova are commonly attached to the body hair, especially of the pubic and perineal region, less commonly of the axilla. The best method of dealing with the ova is said to be the application of the lotion recommended by Gunn: **Naphthalene 1, Sulphur 1, petrol or benzol 100.** The primary pustule, when quite recent and superficial, may be treated by expression of the pus and painting the surrounding skin with **Tincture of Iodine.** When ulceration and crusting have taken place, this ointment is recommended :—

R	Acid. Salicyl.		Ung. Hydrarg. Oxid. Flav.	ad ʒj
	Sulph. Præcip.	āā gr. x		

This is kept applied day and night on lint or linen. In deeper-seated pus infections the patient must be kept in bed and treated on general principles.

See also p. 6 for the employment of **Copper Sulphate**.

REFERENCES.—¹*Jour. R.A.M.C.* 1919, May, 388; ²*Brit. Med. Jour.* 1917, May 5.

RAT-BITE FEVER.

Herbert French, M.D., F.R.C.P.

TREATMENT.—Rat-bite fever is rare, but when met with it is difficult to cure sometimes, incapacitating the patient recurrently for many months. R. V. Solly¹ records two cases that were treated with apparent success by a single dose of **Novarsenobenzol** given intravenously. The accompanying temperature chart from the first of the two cases shows how abruptly the periodic attacks of pyrexia ceased after an injection of 0.45 grm., and the patient remained free from fever and symptoms for a month. There was then a slight reaction, but

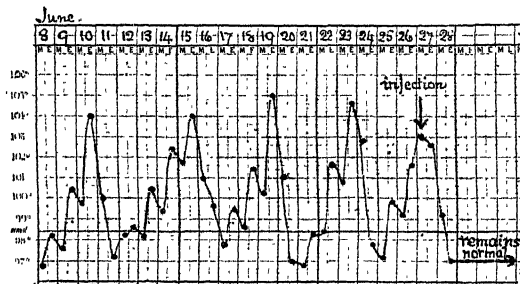


Fig. 43.—Temperature chart of a case of rat-bite fever.

no subsequent rise of temperature occurred, though the patient remained under observation for three months longer. In his other case there had been recurrent pyrexia every five days for over five months. There were no signs of the disease wearing itself out spontaneously; a single intravenous injection of 0.45 gm. of novarsenobenzol was given, and the pyrexial attacks ceased abruptly, as in the first case. No other treatment was adopted. There was one slight relapse a month later, but after that no recurrence at all.

It would be too much to say that all cases of rat-bite fever can be cured at once by so simple a treatment ; but Solly's results were so striking that it would appear that '606' injections should be resorted to.

REFERENCE.—¹*Lancet*, 1919, i, 458.

RECTUM AND ANUS, WAR WOUNDS OF. (*See* FÆCAL FISTULÆ.)

RECTUM, CANCER OF.*J. P. Lockhart-Mummery, F.R.C.S.*

R. Bensaude¹ points out how frequently the early symptoms of cancer of the rectum are overlooked, and how grave a matter this may prove to the patient. Especially he insists upon the importance of a thorough examination in suspected cases, and the value of examination with the sigmoidoscope.

W. A. Darnall² describes the technique of the vaginal route for excision of the rectum for cancer. This operation is practicable only when the tumour is movable and is situated in the lower half of the rectum. He claims for this method that it is simpler, and that the shock of operation is less, while the technique is not unduly complicated.

REFERENCES.—¹*Jour. Amer. Med. Assoc.*, 1919, Feb. 8, 456; ²*Ibid.* June 7, 1670.

RENAL FUNCTION TESTS. (See KIDNEY.)**RETINA, DISEASES OF.***R. Foster Moore, F.R.C.S.*

Hemeralopia in Soldiers.—The war brought to light in a very marked degree the question of night-blindness, and there can be no doubt that a very large number of cases were genuine (MEDICAL ANNUAL, 1919). The fact is that many men had never before in their lives been subjected to conditions which tested their capacity to see in the dark in anything like the degree that trench life demanded. The literature on the subject has been further added to.

A. Birch-Hirschfeld¹ has investigated the condition as to: (1) Previous history of night-blindness (77·8 per cent); (2) Visual acuity; this was normal in 16·2 per cent. Investigation of the threshold stimulus and dark-adaptation rate gave interesting results, and three main types were differentiated: (1) Threshold raised, dark-adaptation not altered; (2) Threshold normal, dark-adaptation altered; (3) Threshold raised, dark-adaptation interfered with.

An interesting report from observations in the French Army is supplied by M. Landolt.² He divides the cases into: (1) Those in whom night-blindness existed before the war; (2) Cases actually caused by the war. In the first group are included ametropes and men with corneal lesions—these he calls nocturnal amblyopes; secondly, the genuine night-blind—i.e., those with fundus disease and the congenitally night-blind. With regard to the second category, the author says: "We have not seen any well-marked cases associated with an enfeebled state of health, but have met a few weakly individuals with normal vision who complain of night-blindness". He adds: "All my confrères are agreed that, with the exception of cases of retinal disease with considerable contraction of the field of vision, the symptom of night-blindness alone does not justify the removal of the man from active service in the field".

Dehogues³ describes a form of night-blindness of a temporary nature which occurs amongst the charcoal burners of Cuba. It seems to be due to the high percentage of CO₂ in the atmosphere when there is little breeze to disperse it, and is accompanied by a marked diminution in the hæmoglobin.

Detachment of the Retina.—Every ophthalmic surgeon would agree that the treatment of this condition is frequently disappointing. On the other hand, all would agree that apart from treatment the prognosis is about as bad as it can be. T. H. Curtin⁴ recommends Rest in Bed, Pilocarpine sweats, subconjunctival injections of Citrate of Soda or other salts, Quinine, or Mercury. Surgical treatment should aim at the removal of the subretinal fluid, and the adhesion of the area of detachment to the choroid. This is attained by trephining the sclerotic over the most dependent part of the detachment, and removal of the subretinal fluid, if necessary by aspiration.

Foster Moore⁵ has shown that retinal detachments are much more common than is usually recognized in cases of renal retinitis; they are overlooked because they are not expressly examined for this complication at intervals up to the time of death. In two years he found thirteen cases at St. Bartholomew's Hospital. If the patient recovers temporarily, the retina shows a marked tendency to become reattached spontaneously.

Retinitis Circinata.—Blake⁶ contributes to our knowledge of this little-understood disease. It was first described by Hutchinson in the *Royal London Ophthalmic Hospital (Moorfields) Reports*, 1876. It is twice as common in females as in males. The pathology is not known. His conclusion is that the condition develops from a previous hæmorrhagic process in the retina.

REFERENCES.—¹*Arch. f. Ophthal.* 1916, xcii, pt. 3; ²*Arch. d'Ophthal.* 1917, July-Aug.; ³*Arch. de Ophal. Hispano-Amer.* 1917, Aug.; ⁴*Amer. Jour. Surg.* 1918, xxxii, 177; ⁵*Royal London Ophthal. Hosp. Rep.* 1916, xx, pt. 2, March; ⁶*Trans. Amer. Ophthal. Soc.* 1916, xiv, pt. 2, 753.

RETROPHARYNGEAL ABSCESS.

Frederick Langmead, M.D., F.R.C.P.

Though easy to diagnose, retropharyngeal abscess in infants does not seem to be so well known as it should be. Difficulty in swallowing and breathing, with cyanosis, stertor, recession of intercostal spaces, a nasal, or choking and toneless cry, regurgitation of food through the nose, and head retraction make a picture distinctive enough in a small infant one or two years of age. Inspection may reveal the retropharyngeal swelling, but when these symptoms are present, the palpating finger is the correct instrument to establish the diagnosis, when a central or laterally placed tight but fluctuant swelling is felt in the back of the throat.

A. N. R. Schiller,¹ from a study of twenty-one cases, lays stress on the diagnostic value of submaxillary adenitis on the same side as the abscess. This, he says, is the first sign, and one which every case presents. The glandular swelling is puffy but not red, and is soft, never hard. The glands are small and discrete, never matted. The amount of swelling is considerably greater than the glandular enlargement.

PROGNOSIS.—Unrecognized, retropharyngeal abscess may cause death by asphyxia, and prognosis depends upon the period which is allowed to elapse after fluctuation begins. Bokai in a series of 317 cases reported 14 deaths.

TREATMENT.—The incision is made through the mouth with a protected scalpel, and should open all pockets of pus. The child is held in the lap of an assistant, and the mouth kept open by a tongue-depressor or by forcing the cheek between the jaws. A mouth-gag should never be used. As soon as the abscess is opened, the child's head is bent forwards to allow the pus to drain through the mouth and nose.

REFERENCE.—¹*Med. Rec.* 1918, ii, 457.

RHEUMATOID ARTHRITIS.

Herbert French, M.D., F.R.C.P.

MORBID ANATOMY AND HISTOLOGY.—T. S. P. Strangeways,¹ having had unique opportunities for studying the pathological lesions in and around the joints themselves in cases of rheumatoid arthritis that have been under his observation at the Cambridge Research Hospital, has recorded these changes with much detail, and summarizes them under the following headings:—

1. The term rheumatoid arthritis, as at present used, includes several forms of arthritis which are clearly due to different causes, although clinically they may show several points of similarity.

2. The crippling and deformity associated with rheumatoid arthritis, or what is taken as such, is largely of muscular origin, which may be: (a) Of the nature of an involuntary contraction brought about by pain referred to the

joint of the crippled limb ; (b) Due to an involuntary muscular spasm caused by pain on movement of the damaged joint ; (c) Due to actual atrophy and shortening of some of the muscles connected with the diseased joint. This atrophy is usually associated with disuse and long-continued muscular spasm.

3. In other cases the deformity is due to changes in the joint itself, such as : (a) Distention of the capsule by an excess of synovial fluid ; (b) Dislocation of the bones of the articulation ; (c) Changes in the shape of the articular surfaces owing to formation of new bone or to erosion of the original.

4. Some cases in which clinically the joints appear to be damaged, show very little morbid change on post-mortem examination, although the symptoms of arthritis with crippling deformity have been present for many years. Some of these cases seem to be of nervous origin, associated with pain which is referred to the joint.

5. Cases are observed in which the capsule of the joint has been distended for a long period by an excess of synovial fluid accompanied by more or less deformity, but in which on post-mortem examination no marked changes are discovered. In some examples of this type the fluid ultimately diminishes. Fibrotic changes may then be present in the capsule, and the articular cartilages may have undergone fibrillation or atrophy.

6. A considerable proportion of the joints show distinct inflammatory changes in the synovial membrane, in the capsule, or in the bones of the articulation ; in any case the articular cartilage may be involved. These inflammatory lesions may be present in one or all of the above-mentioned structures, and be either acute, subacute, or chronic.

7. In a few cases the processes are obviously of infective origin, and are associated with marked inflammatory changes in the synovial membrane and the formation of thick fleshy villi and vascular adhesions. Microscopically the inflamed tissues show large collections of inflammatory cells and new capillaries. Erosion of the articular cartilage and bones may also be present.

NATURE OF INFLAMMATORY PROCESS.

8. If changes are found in a joint affected with what is termed rheumatoid arthritis, they are usually of an inflammatory nature, but their severity and extent vary considerably in different cases, and in different joints from the same case. The changes may be present in a part only of the articulation.

9. The inflammatory process may originate either in the synovial membrane, in the capsule, or in the medulla of the superficial cancellous spaces of the epiphysis, or in all three of these structures.

10. The inflammatory process, if severe, is associated with proliferation of the connective-tissue cells, the development of new blood-vessels, the accumulation of leucocytes, and sometimes with the extravasation of red blood-corpuscles and the presence of fibrin. The inflammatory tissue may originate in the synovial membrane or in the capsule, and invade the articular cartilage and bone, or lead to the formation of inflammatory adhesions in the joint cavity. This inflammatory tissue tends in the course of time to become organized and converted into fibrous tissue, and may result in fibrous ankylosis, either between the adjacent surfaces of the capsule or between the cartilage, or even between the bones of the articulation if the original cartilage has been destroyed.

11. In some cases the arthritis is of a subacute type from the onset, and the inflammatory changes, although often progressive, are not so marked. In this type the changes may originate in the synovial membrane, the capsule, or the superficial marrow spaces of the epiphysis, from either of which they may spread to the articular cartilage ; the process leads to the formation of fibrosing

tissue in the affected areas, and this when present in the capsule causes the latter to contract. The movements of the limb are in consequence restricted, and the articular cavity is decreased in size. Fibrous adhesions also develop in these joints, and in some cases fibrous, cartilaginous, or bony ankylosis.

12. The changes in the superficial marrow spaces lead to resorption or erosion of the osseous trabeculae, which may be associated with the invasion and replacement of the articular cartilage by the inflammatory tissue.

13. Other joints show a slowly progressive inflammatory fibrosis of the capsule, often associated with degenerative changes in the cartilage and proliferative changes in some of the superficial marrow spaces. In these joints, areas of cartilage may be invaded either superficially from the capsule or from beneath by proliferating connective-tissue cells and new vessels of the superficial marrow spaces.

14. The inflammatory reaction of the marrow of the superficial cancellous spaces of the epiphysis may be of an acute, subacute, or chronic type. In either type the connective-tissue cells of the marrow proliferate and new blood-vessels form. In the acute cases the new connective-tissue cells are of stellate form. In the chronic cases the connective-tissue cells appear more fibroblastic, especially such as are near the edges of the bone trabeculae, but in all cases these cells show a tendency to store up fat and become marrow-cells as the inflammatory process subsides. In those cases where the superficial osseous trabeculae are eroded and the zone of calcified cartilage is invaded, the connective-tissue cells and vessels form a definitely organized fibrotic tissue, the cells of which do not show the same tendency to produce fat.

15. In no instance has it been possible to demonstrate peri-articular changes of an inflammatory nature around the affected joints, and it is doubtful if there is such a condition as peri-articular rheumatoid arthritis.

CHANGES IN CARTILAGE.

16. The changes in the cartilage vary considerably in different joints from the same case, and even in the same joint.

17. The articular cartilage may show signs of atrophy, accompanied by modifications in the staining reaction of the matrix.

18. The articular cartilage may show proliferation of its cells, which results in the formation of cell groups usually surrounded by an unstained zone.

19. The cartilage may become definitely fibrillated, and with this change there is usually evidence of proliferation and the formation of groups of cartilage-cells. The fibrillation begins, as a rule, on the free surface, and may extend to the deepest parts of the articular cartilage.

20. The hyaline cartilage may become converted into a modified fibro-cartilage, but in such specimens there is usually evidence of some inflammatory process in the neighbourhood of the altered structure. This process seems to be due to proliferation of the cartilage-cells, but in some specimens the connective-tissue cells of the inflammatory tissue also appear to take part in the formation of fibrocartilage.

21. Areas of the articular cartilage may become necrotic; this necrosis may be found where inflammatory reaction has taken place. The edges of the necrotic mass often show a beautiful replacement fibrosis, which may eventually lead to the complete removal of the necrotic tissue.

22. In some joints portions, or even the whole layer, of the articular cartilage may be infiltrated and replaced by a more or less vascular inflammatory tissue, owing to the cartilage having been invaded by new blood-vessels and connective-tissue cells. In certain specimens the cartilage cells proliferate and appear to take part in the formation of the new tissue which has replaced the cartilage.

This replacement of cartilage may begin either on the free surface from an inflammatory process spreading from the synovial membrane or capsule, or in the deeper parts of the cartilage by the extension of an inflammatory process from the adjacent marrow spaces.

CHANGES IN BONE.

23. The articular bone may show atrophy, rarefaction, resorption, or erosion.

24. The superficial osseous trabeculae underlying those portions of the articular cartilage in which advanced atrophy, fibrillation, or complete wearing away has taken place, may show increase in size and density owing to formation of new bone, brought about by continued use of the limb, notwithstanding the joint changes. The amount of the new bone formed appears to depend upon the reaction of the tissues to pressure, and this increases in proportion to the weight and friction on the affected area. In those instances where the cartilage is absent and the superficial bone exposed, this process leads to polishing of the superficial surface of the sclerosed bone. Associated with this increased density of the osseous trabeculae, minute fractures are often seen; these are probably of traumatic origin. In the neighbourhood of these fractures there is generally callus formation, with a combined process of resorption and repair around the injured area. These changes are characteristic of osteo-arthritis, but are not common in rheumatoid arthritis.

25. In those instances in which the inflammatory changes are confined to the synovial membrane, active changes are not observed in the bone-marrow or osseous trabeculae, but there is often atrophy of the osseous trabeculae in the neighbourhood of the affected joint; this appears to be due to disuse.

26. When an inflammatory process attacks the articular cartilage or bone of a joint, inflammatory changes do not, except in rare instances, involve the whole of the epiphysis, but are usually strictly confined to the quite superficial cancellous spaces and superficial osseous trabeculae. As a rule these changes are not found over the whole of the articular surface, but only in isolated areas; they vary greatly in intensity and extent in different joints or in different parts of the same joint. The process may be a chronic, slowly progressive resorption of bone, accompanied by new formation of bone in the neighbourhood. In such areas very few or no multinucleated osteoclasts are observed. When the process is more active, proliferative changes are found in the bone-marrow, with congested blood-vessels, osteoclasts, and inflammatory cells. This process often leads to erosion of the articular cartilage and the underlying bone; with very rare exceptions the formation of new bone can be seen taking place in the affected area. In some cases the resorption of bone is more rapid than the new formation; in others formation of new bone is in excess.

DEVELOPMENT OF NEW BONE.

27. The development of new bone in a damaged joint may take place: (a) In the articular cartilage; (b) In altered articular cartilage; (c) In the zone of calcified cartilage; (d) On the edge of pre-existing bone trabeculae; (e) In inflammatory connective tissue in the cancellous spaces; (f) In fibrous adhesions.

28. The development of new bone in hyaline cartilage may be due to changes in the cartilage-cells; these changes are usually preceded by vascularization of the affected area, and by a deposition of calcium salts in the surrounding matrix. This is followed by proliferative changes in the cartilage-cells and the general development of new bone from the modified cartilage-cells.

29. The development of new bone in altered hyaline cartilage—for example,

fibrocartilage—may occur through changes similar to those described in the hyaline.

30. The development of new bone is sometimes seen in areas of vascular inflammatory tissue which has invaded and replaced a portion of the articular cartilage. The new bone in this case may either be formed by cartilage-cells, as above described, or from the connective-tissue cells of the inflammatory tissue.

31. The development of new bone in the zone of calcified cartilage may be due to changes similar to those described in the hyaline.

32. In rheumatoid arthritis the development of new bone on the edges of pre-existing bone trabeculae is usually accompanied by proliferative changes in the marrow, which lead to resorption of bone in the neighbourhood of the new formation. The two processes occur simultaneously, and appear to depend upon some irritant causing increased blood-supply which brings about resorption, and to pressure on the affected area from use of the limb, which causes the development of new bone.

33. Where new bone develops in inflammatory tissue which has replaced the marrow and osseous trabeculae, it appears to be formed from connective-tissue cells in this inflammatory tissue.

34. New bone in fibrous adhesions appears to be formed from the connective-tissue cells of the fibrous tissue.

35. In all the above instances the development of new bone is associated with the formation of cancellous spaces and marrow tissue. The new marrow usually consists of adipose tissue. The formation of the cancellous spaces appears to be due to the development of new blood-vessels, to changes in the vascular supply, and to the development of stellate connective-tissue cells in which fat accumulates.

LIMITATION OF MOVEMENT.

36. Limitation of movement in a joint may be due to : (a) Muscular spasm ; (b) Shortening and atrophy of muscles and tendons ; (c) Fibrotic changes in the capsule leading to contraction ; (d) Alteration in shape of the articular surfaces ; (e) Ankylosis, which may be fibrous, cartilaginous, or osseous.

37. Where the limitation of movement in a joint is due to muscular spasm, it can be overcome by deep anaesthesia, but it returns when the effect of the anaesthetic has passed off.

38. The passive movement of a joint in which shortening and contraction of the muscles and tendons is suspected should not be lightly undertaken, as this condition is often associated with fatty changes in all the tissues of the joint, and fracture of any or all the tissues round the joint may take place.

39. Fibrotic changes in the capsule associated with contraction may be so extreme that the joint cavity is completely obliterated and the joint surfaces lie in close contact with the fibrous capsule, moulded tightly around the articulation.

40. Fibrous ankylosis is due to adhesions formed by the organization of inflammatory tissue, which may originate either in the synovial membrane, the capsule, or in the superficial marrow spaces. These adhesions may partly or completely occlude the joint cavity. They may consist of long processes of more or less vascular fibrous tissue, which thus allow limited movement to take place in the joint, or of dense contracted fibrous tissue which firmly unites the articular spaces of the two bones (fibrous ankylosis).

41. The articular cartilage may become ankylosed by the matrix of the two layers of the hyaline cartilage becoming fused into one continuous layer, or the two layers may unite and be transformed into a modified fibrocartilage. The ankylosed cartilage may become necrotic, and is often invaded and replaced

by an inflammatory fibrous tissue, or new bone may develop in the ankylosed cartilage, and thus bring about osseous ankylosis.

42. Osseous ankylosis takes place by the development of new bone, either in ankylosed cartilage, or in the fibrous tissue which has already produced fibrous ankylosis.

43. Ankylosis may occur between the two zones of calcified cartilage, but this form of fusion shows a tendency to become replaced by one of true bone.

VILLOUS OUTGROWTHS.

44. Villous outgrowths are found in some joints. These may be due to: (a) Overgrowth of normal villi; (b) Inflammatory changes in the synovial membranes or in the capsule.

45. Villous outgrowths in a joint may consist of: (a) Vascular fibrous tissues; (b) Dense fibrous tissue; (c) Fibrous tissue enclosing groups of fat-cells; (d) Inflammatory tissue with dilated capillaries and with groups of inflammatory cells; (e) Degenerated or necrotic tissues; (f) Connective tissue showing vessels deeply congested owing to obstructed circulation.

46. Villous outgrowths may become detached by rupture of the fine pedicles, and so form loose bodies in the joint cavity. The detachment may be preceded by necrosis.

47. Microscopic villi formed of cartilage are occasionally found on the surface of altered articular cartilage. These may be formed of hyaline or fibro-cartilage.

48. No constant changes are found after death in the organs or tissues of patients who have suffered from rheumatoid arthritis.

REFERENCE.—¹*Lancet*, 1918, ii, 628.

RHUS DERMATITIS.

E. Graham Little, M.D., F.R.C.P.

The wide distribution of poison-ivy in the United States makes prophylactic measures against the dermatitis caused by it of practical importance. Schamberg¹ has devised a means of partial protection against attacks, and a certain degree of mitigation of actual eruptions. In the latter event a slightly increased dosage is recommended. He suggests that a similar procedure, using the respective tinctures indicated, may be useful in primula and other varieties of plant dermatitis. The method of treatment is as follows:—

R Tinc. of Rhus Toxicodendron 1 c.c. | Syrup of Orange sufficient to make 100 c.c.
Rectified Spirit 5 c.c.

The patient is instructed to take the mixture in half a glass of water after meals, as follows:—

Breakfast, drops		Lunch, drops		Dinner, drops	
1	..	2	..	3	..
4	..	5	..	6	..
7	..	8	..	9	..
10	..	11	..	12	..
13	..	14	..	15	..
16	..	17	..	18	..
19	..	20	..	21	..

When this dosage has been reached, for purposes of convenience and simplicity the patient takes a *teaspoonful* in half a glass of water merely *once a day*. This should be continued throughout the ivy season.

It has been the author's experience that the immunity (if one can call it such) established after one month's administration will persist for *about a month* afterward. After this, susceptibility is prone to return.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, lxxiii, 1213.

RIBS, CERVICAL AND FIRST DORSAL, PRESSURE ON ADJACENT STRUCTURES. (See NERVES, PERIPHERAL, SURGERY OF.)

RICKETS. (See also DEFICIENCY DISEASES; INFANT FEEDING; VITAMINES.)

Frederick Langmead, M.D., F.R.C.P.

The year has been very fruitful in important investigations into the nature of rickets. E. Mellanby¹ has carried out elaborate work with puppies. Many experiments were first made to see whether the etiology of rickets was to be sought along non-dietetic lines, and it was only after failure that the dietetic solution was resorted to. The work has shown that, however important other factors may be, the dietetic problem is the key to the situation. No particular breed of puppy was selected, and 200 were used. The methods employed to detect the rickets produced were x-ray examination of the bones, calcium estimation of the bones after death, and histological preparations of the bones. The differences between the normal and rachitic dogs were similar to those between children. The puppies were given their special diets after leaving the mother, at ages varying between five and eight weeks. In the earlier periods they were usually killed after five or six months, but afterwards this period was considerably shortened. The following diets were each found to produce rickets under laboratory conditions:—

Diet I.	Diet II.	Diet III.	Diet IV.
Whole milk, 175 c.c. Oatmeal, rice, NaCl, 1-2 grms.	Whole milk, 175 c.c. Bread, ad lib.	Separated milk, 175 c.c. Bread (70 per cent wheaten), ad lib. Linseed oil, 10 c.c. Yeast, 10 grms. NaCl, 1-2 grms.	Separated milk, 250-350 c.c. Bread (70 per cent wheaten), ad lib. Linseed oil, 5-15 c.c. Yeast, 5-10 grms. Orange-juice, 3 c.c. NaCl, 1-2 grms.

The modifications in the diets were made to ensure more rapid development of rickets and to be compatible with better health and rate of growth, for the better the animal grows the more easily is rickets produced.

Having obtained diets which could be counted upon to produce rickets, various substances were added and their effect on the development of the disease noted. With *Diet I* it was found that increasing the whole milk from 175 to 500 c.c. per diem prevents the development of rickets. On *Diet II* not only does meat, but also its watery and alcoholic extracts, exert an inhibitory effect. On the other hand, the protein residue after the loss of extractives allows rickets to develop. Yeast has no protective influence. Malt extract does not prevent, but delays, the onset of rickets when added to *Diet II*. The effect of different fats was now investigated, and almost uniformly they prevented rickets, linseed oil being an exception. *Diet III* was used in order to eliminate the milk fat by using separated milk and replace it by linseed oil. Yeast was also added. With this diet it was possible to discover that the value of the oils in preventing rickets is graded—cod-liver oil being the best and linseed oil the worst; the vegetable oils, olive and arachis, are not so good as butter. Orange-juice did not prevent rickets. Further, the addition of 5 grms. calcium phosphate, or doubling the separated milk and so increasing the calcium intake in this form, was without preventive action. In *Diet IV*, therefore, the separated milk was doubled and 3 c.c. orange-juice given per diem. This improved the growth and general health of the puppies, as also

did the substitution of a small quantity of commercial yeast extract for the 5 grms. of yeast.

It was found that although meat did not prevent rickets it had some inhibitory effect, for when given with a small amount of butter, as in *Diet II*, it enhanced the anti-rachitic effect of the butter.

The results of these experiments indicate that rickets is a deficiency disease which develops in consequence of the absence of some accessory food factor or factors. Of the three factors known, *Fat-soluble A*, *Water-soluble B*, and *Water-soluble C*, two can be excluded, for yeast which contains *Water-soluble B*, and orange-juice which contains *Water-soluble C*, failed to inhibit the disease. On the other hand, the anti-rachitic substances for the most part have been found to be similar to those in which *Fat-soluble A* is present. It therefore seems probable that rickets is caused by an inadequate intake of an anti-rachitic factor which is either *Fat-soluble A*, and intimately connected with growth, or a factor of somewhat similar distribution. Another point which has been established is that rickets develops much more quickly in fast-growing puppies; more anti-rachitic substance is therefore necessary in a rapidly-growing dog to keep the growth straight. There are three difficulties in the way of accepting *Fat-soluble A*, as the anti-rachitic factor. In the first place, deficiency of *Fat-soluble A* inhibits growth, yet rickets develops most in rapidly-growing puppies; secondly, meat and meat extracts have more effect in preventing rickets than their content of *Fat-soluble A*, as shown by growth experiments in rats, would lead one to expect; thirdly, the growth experiments on rats did not bring out any grading in the values of vegetable oils in this respect, but led to all of them being described as deficient in *Fat-soluble A*. Perhaps these difficulties are not insuperable, for the dog may prove to be a more delicate test than the rat.

Mellanby compares and contrasts these results with the current hypotheses of the etiology of rickets.

1. *Deficiency of Fat*.—The recent experiments show that it is not the fat *per se*, but rather the type of fat, which confers benefit; animal fats, especially cod-liver oil, containing the anti-rachitic factor in greater abundance than vegetable oils.

2. *Excess of Carbohydrate*.—Such a diet contains excess of cereals which, especially after being submitted to manufacturing processes, are very deficient in the anti-rachitic factor. It is therefore most effective in producing rickets.

3. *Deficiency of Fat and Excess of Carbohydrates*.—This diet, combining both the previous defects, is liable to produce rickets for the reasons given.

4. *Deficiency of Calcium Salts*.—Abundance of calcium salts alone will not prevent rickets if the anti-rachitic factor is lacking; on the other hand, if the salts are deficient as well, a more acute production of rickets is to be expected.

5. *The 'Domestication' Theory*.—This theory includes in a comprehensive way all the unhygienic conditions incidental to civilized, and particularly to crowded, communities. The modern mode of life has involved two main changes—dietetic, and greater confinement and lack of fresh air. The experimental results indicate that the former is of prime importance, but in a different way from that usually believed. Criticizing Findlay's work on the ill effects of confinement, he points out that the dogs used were fed on a diet which usually produces rickets, and therefore would do so in confinement. His own experience is that confinement will not produce symptoms of rickets in adequately-fed puppies.

A recent investigation at Glasgow by Miss Ferguson appears to show that

the development of rickets is favoured by insufficient space in houses, confinement, and imperfect parental care. The average consumption of food in rachitic and non-rachitic families respectively shows, however, that there is an increase in the diet of the rachitic families of substances allowing rickets, and a decreased amount of anti-rachitic substances.

It appears from Mellanby's work that the foodstuffs of an infant ought to contain a maximum amount of anti-rachitic factor. But, since the dietetic problem is one of balance, foodstuffs containing no anti-rachitic substance cannot be considered as neutral, but positively as rickets-producing, for the more of them that is eaten the more the need for the anti-rachitic factor. It is probable that bread is the worst offender, and too much bread spells disaster. The amount of fat a child can deal with is limited, and it is important to give it the best type. The natural fat is that of milk, and to give it a vegetable fat is both to limit the amount of butter it can eat, and to weigh down the diet in the direction of rickets. Cod-liver oil is the best additional fat. Milk is undoubtedly better than the corresponding amount of butter. With breast-feeding the child would usually be assured a good supply of anti-rachitic factor, but the mother's diet must itself contain an adequate amount. This is procured if she takes the milk of a cow which has been fed on grass, which is a good source of *Fat-soluble A*. A cow fed on oil-cake, however, will give a milk deficient in accessory food factors, which affords a possible explanation of the greater incidence of rickets in the winter months when the cow's diet is artificial. In these days when proprietary articles are so commonly used as foods for children, it is of vital importance that they should be judged by their accessory food-content as well as by the amount of protein, fat, carbohydrate, and salts they contain. Thus synthetic milks should be discontinued unless these factors are abundant. Similarly vegetable oils do not replace animal fat in the dietary.

H. C. Cameron,² writing on the Report of the Medical Research Committee on the inquiry carried out in Glasgow by Miss Ferguson under the direction of L. Findlay and Noel Paton, queries whether the factors on which they lay stress—overcrowding, want of air and sunshine, and lack of exercise—do not act by lowering the child's resistance to infection. Repeated catarrhal infections are common under such conditions, and the loss of weight ensuing may be both great and rapid. Such fluctuations in health and weight lead to increased vulnerability of the tissue-cells, as shown by painful dentition, perleche, and napkin dermatitis. In the muscles there are rapid wasting and loss of tone. Excessive perspiration, coldness and blueness of the extremities, and undue pallor, persist long after repeated or continued pyrexial infection. The prejudicial effects upon the nervous system are shown by convulsions, laryngismus, tetany, loss of co-ordinate movement, and immobility from exhaustion. The child may even be left infantile in body and mind. The activity of the enamel organ is inhibited from time to time, as shown by subsequent circular caries, and the nails become ridged. These changes resulting from repeated infections being so considerable, he asserts that osteoblastic activity is also inhibited, and that rickets results from infection, environmental factors only predisposing thereto. [An admirable picture is drawn of the result of repeated infections, in fact, of the imperfectly recovered and ailing child, but it does not bring conviction that so is rickets explained, for he adduces no proof that osteoblastic tissue is actually inhibited, and even if it were, there is no proof that such an inhibition causes rickets rather than any other form of acquired defect of osseous growth.—F. L.]

Mrs. Mellanby³ has shown by experiments on puppies that hypoplasia of the teeth is caused largely by a deficient diet, that the factor in the diet which

controls the calcification of the teeth is in the nature of an accessory food factor (vitamine), and that this factor has a similar distribution to that of *Fat-soluble A*, a deficiency of which produces rickets. Applying the results of her experiments to explain the defective teeth of rickets, she points out that a child's diet is most likely to be deficient in *Fat-soluble A* from the ninth month to about the second year of life, i.e. at the transition period between complete milk diet and one approximating to that of the adult. The permanent teeth calcifying at that time are the incisors, the canines, and the first molars, and it is these teeth in children which are most often hypoplastic and carious. Since rickets is commonest in children during these early months, it has been suggested by Dick and others that this disease is responsible for the frequency with which these particular teeth are affected. In these experiments, at any rate, the evidence points to defect of teeth as being due to an error in the value of the diet, and not to bacterial sepsis or other oral conditions associated with food.

REFERENCES.—¹*Lancet*, 1919, i, 407; ²*Ibid.* 1918, ii, 646; ³*Ibid.* 767.

RINGWORM.

E. Graham Little, M.D., F.R.C.P.

THERAPEUTICS.—Kren¹ contributes a well-reasoned and philosophical article on the principles of therapeutics. Dealing with *tinca circinata*, he points out that the desideratum is to find an agent which will exfoliate the skin without injuring it. He reviews the action of soaps, solutions, ointments, pastes, and light treatment. Alcoholic solutions are to be preferred to watery, probably because alcohol exerts an astringent action. Iodine, sublimate, carbolic acid, resorcin may all be conveyed in this solution. He prefers of these 2 to 4 per cent solutions of **Salicylic Acid**, 2 to 3 per cent solutions of **Carbolic Acid**. Soaps may incorporate resorcin, sulphur, or salicylic acid, or plain soft soap or spirit solution of soft soap may be used. These should be rubbed in with water and allowed to dry, baths not being permitted during the treatment. Ointments are not as a rule well borne, and should be replaced entirely by pastes. These should be applied in as thin a coating as possible, and not covered with linen. They are sometimes improved by the addition of alcohol and exfoliating agents. A paste of 3 per cent salicylic acid, with or without sulphur, is recommended. For restricted surfaces without induration, the application of the **Quartz Lamp** is highly extolled. Infections of the hairy parts of course require entirely different measures, involving **Epilation**, either manually or by *x* rays. When performed manually, the affected hair is apt to break off when pulled, and must be treated again when it grows long enough to allow of seizure by forceps; its tedious and uncertain operation makes **X Rays** preferable, especially in ringworm of the beard, in which condition *x* rays materially reduce the infiltration usually present. The drawbacks of *x* rays are well known and need not be dwelt upon. The author properly emphasizes the caution that the skin should be disinfected after *x*-ray treatment, which in no way destroys the infectivity of the disease: 2 to 5 per cent solutions of **Salicylic Acid** in alcohol are recommended for the purpose. If there is deep infiltration, it is best to poultice or foment the parts during the day and to wear a 10 per cent salicylic acid and soap plaster at night. The pus must be evacuated carefully before any of the treatments before described are applied, and in particular light should not be used in these conditions. Large collections of pus should be incised and evacuated surgically. Immunization methods of modern introduction do not succeed well with superficial infections, and if used should be combined with the older local treatment.

Margosic Acid recommended (p. 10).

REFERENCE.—¹*Wien. klin. Woch.* 1919, June 19, 653.

RUBELLA.*J. D. Rolleston, M.D.*

Lesieur and Jacquet¹ examined the blood in 10 cases of measles and 15 of rubella, and found that while the blood formula during the eruptive period of measles was characterized by an ordinary polymorphonuclear leucocytosis, in rubella there was a mononuclear leucocytosis, chiefly affecting the moderate forms, and often accompanied by a leucocytosis of the mast cells at the onset of convalescence. Examination of the glands affected in a large number of rubella cases showed that enlargement of the occipital glands was very inconstant, being absent in about half the cases. Inguinal and axillary adenopathy was much more frequent, though less characteristic. Enlargement of the epitrochlear glands appeared almost constant, and formed a valuable sign.

REFERENCE.—¹*Presse Méd.* 1919, 292.

SANDFLY FEVER. (*See* PAPPATACI FEVER.)**SARCOID.***E. Graham Little, M.D., F.R.C.P.*

Bosellini¹ reports a case under this title which by his description would approximate rather to the sarcomatous than the tuberculous growths. The patient was a boy of 14 years. He developed the first nodule in the submaxillary region on the left side, followed by a similar growth on the right side. At the same time lesions appeared on the gums and palate, and there was general enlargement of the accessory glands. When seen later there were numerous nodules on the left eyelid, the submaxillary region, the neck, and the trunk, hemispherical in shape, of the size of a pea to a nut, wine-red in colour, indolent elastic circumscribed tumours, movable on the underlying tissues. The mouth cavity was the seat of a fungating growth occupying the gums and hard palate chiefly. The submaxillary, mastoid, pre-auricular, supramaxillary, epitrochlear, and inguinal glands were all enlarged. The blood-count showed no abnormality and no leucocythæmia. The Pirquet, tuberculin, and Wassermann tests were all negative, and inoculation tests in animals did not produce any pathological results. The temperature varied from 37° to 39° C. The spleen was enlarged, the abdomen distended with gas. The administration of **Liquor Arsenicallis** (dose not stated) by the mouth produced a most rapid and complete regression of the tumours and restoration of the general health. Histological examination demonstrated a structure like that of Kaposi's telangiectatic hæmorrhagic sarcoma.

REFERENCE.—¹*Policlínico (Sez. Med.)*, 1919, April 1, 147.

SCABIES. (*See also* PYODERMIA.)*E. Graham Little, M.D., F.R.C.P.*

Knowles,¹ working at a British base hospital in France during the War, came to the conclusion that of 2000 cases seen in the skin department of this hospital, 1500 could be attributed to scabies or its after-effects. He gives two useful tables (see opposite page), the first differentiating pediculosis from scabies, the second comparing scabies in civil and military experience.

The routine treatment adopted is thus described: On the first day the patient is given a **Warm Bath** with plenty of soap. One rubbing is given with **Sulphur** (precipitated sulphur, 1 dr. to the ounce of petrolatum). On each of the next three days a sulphur rubbing is given (for a minimum of fifteen minutes). On the fifth day a warm bath with plenty of soap, and clean clothes, are given. Thorough and minute examination of the entire body is made to insure that no active disease remains. If active lesions are still present, four more days of sulphur rubbings are given, followed by another warm bath, another careful examination of the skin surface, and clean clothes.

Table I.—DIFFERENTIATION BETWEEN SCABIES AND PEDICULOSIS CORPORIS.

<i>Scabies.</i>	<i>Pediculosis Corporis</i>
General in distribution, exclusive of the face and scalp	General in distribution, exclusive of the face, scalp, hands, feet, and the lower arms and the lower legs
Predilection for the webs of fingers, flexure surface of the wrists, penis, flexure surface of extremities, and anterior surface of trunk	Predilection for extensor surface of the upper arms and upper legs, and posterior surface of the trunk, particularly across the shoulder and lower back
Diagnostic sign the 'burrow', a minute zigzag line, consisting of alternating blackish and whitish dots, the width of a thin thread, and from the smallest fraction to $\frac{1}{8}$ inch in length; itch mite too small to look for; pinpoint in size	Diagnostic sign the pediculus, small pinhead in size, found in the seams of the clothes more frequently than on the body
The eruption we speak of as multi-form: papules, vesicles and pustules, boils, and large crusts	The eruption consists chiefly of long, linear scratch marks, small punctate hæmorrhages, and excoriations: not infrequently crusts and boils
Itching severe, usually at night	Itching severe, usually at night

Table II.—SCABIES IN CIVIL LIFE AND IN MILITARY LIFE.

<i>Scabies in Civil Life.</i>	<i>Scabies in Military Life.</i>
Eruption usually on the lateral aspect and webs of fingers, consisting of pustules and burrows, excepting in those unusually cleanly, in washerwomen, and mechanics who work in oils, greases, graphite, etc.	Hands are involved in but few cases
Penis frequently shows only one or two pustules and burrows, and occasionally none	Penis usually shows a marked involvement, numerous pustules and burrows
Complications are absent in most cases	Complications, such as unusually large number of pustules, boils, impetigo, and the so-called I.C.T. (secondary pustular lesions), are frequently present

For the secondary pustular conditions so common after scabies, the author finds no better remedy than **Ammoniated Mercury Ointment**, 20 to 40 gr. to the ounce of vaseline. Incipient boils are treated by rubbing in thoroughly each day for ten minutes a 25 per cent **Ichthyol Ointment**. Extensive impetiginization may call for rest in bed and the local application of an ointment consisting of 20 gr. of **Ammoniated Mercury** to the ounce of **Zinc Oxide ointment**.

Cumston² quotes a method recommended by Oppenheim for the rapid treatment of scabies, as follows: The entire body is rubbed for a quarter of an hour with **Sapo Viridis**, after which the patient enters a warm bath and removes the soap with a brush of wood-fibre. The process of mechanical removal of the soap should last half an hour. The patient then comes out of the bath and dries the skin thoroughly with towels, after which the following is applied:—

R Sulphur. Præcip.	25 grm.	Vasolini	125 grm.
Potass. Carbonat.	10 grm.		
	M. Ft. unguentum.		

Two hours later another warm bath is taken, the ointment is washed off, and, after drying the skin, a zinc paste is applied. This completes the cure.

In private practice Cumston prefers the following method: The patient rubs *sapo viridis* carefully all over the body and neck up to the chin, care being taken to cover well the interdigital spaces of the hands and feet. A hot bath of half an hour's duration is then taken, the soap being removed by *mild friction*. After the skin has been thoroughly dried, the following ointment is rubbed in:—

R	Ichthyol	10 grm.	Potass. Carbonat.	6 grm.
	Sulph. Sublimat. (or		Camphor. Trit.	2 grm.
	preferably Sulph. Præcip)	12 grm.	Adipis	60 grm.
	M. Ft. unguentum.			

The patient sleeps in this application, and the next morning should take a hot sulphur bath, which completes the cure.

G. Milian³ recommends the following ointment as more absorbable than sulphur ointment: **Potassium Sulphide** 50 grm., water 250 grm. Dissolve and incorporate with 250 grm. each of soft paraffin and lanolin. Afterwards add **Zinc Oxide** 5 grm., liquid paraffin 200 grm.

Levy⁴ recommends, in simple uncomplicated cases of scabies, swabbing the whole body, with the exception of the face, with a cotton glove soaked in **Petrol**. Twenty minutes later the patient is covered with a paste of the following composition:—

R	Zinci Oxidi	gr. xx	Lanolini	
	Talcii Pulv.		Vasellini	
	Amyli	āā gr. x		āā ȳss

The clothes are changed after this treatment, which is to be repeated on the two following days, or in some cases two treatments may suffice.

Margosie Acid recommended by Chatterji (p. 10).

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, Nov. 16, 1657; ²*Med. Rec.* 1919, Feb. 22, 325; ³*Paris Méd.* 1918, May 18; ⁴*Presse Méd.* 1919, April 17, 206.

SCALDS AND BURNS.

Inflammation arising from, arrested by the application of **Magnesium Sulphate** solution (p. 9).

SCARLET FEVER.

J. D. Rolleston, M.D.

T. M. Rivers¹ records a case of hæmorrhage into a post-scarlatinal cervical abscess in a girl, aged 5½ years. The hæmorrhage occurred three days after the abscess had been opened, and was found to be due to erosion of the lingual and external carotid arteries and internal jugular vein. The common carotid was ligatured, and the hæmorrhage from the internal jugular was controlled by packing. Normal saline was given subcutaneously, and citrated blood from the mother was injected intravenously. Although another large hæmorrhage took place six days later owing to the ligature sloughing, the child ultimately recovered. Rivers has collected 32 other cases, to which should be added the 2 fatal cases recorded by J. H. Griffiths and D. Riddell (see MEDICAL ANNUAL, 1911, p. 504).

Bic² states that the isolation period for scarlet fever has gradually been reduced at the Blegdam Hospital, Copenhagen, without any effect on the incidence of the disease in the town. Sorensen, with 10,220 patients in ten years and an isolation period of 56 days, had 3.6 per cent return cases; while Bic, in three years, had only 1.9 per cent with his 38-day period.

REFERENCES.—¹*Johns Hop. Hosp. Bull.* 1919, 240; ²*Jour. Amer. Med. Assoc.* 1919, ii, 462.

SCURVY. (*See also* DEFICIENCY DISEASES; VITAMINES; and ANTISCORBUTICS, p. 3.) *Herbert French, M.D., F.R.C.P.*

A considerable amount of work has been published during the year upon scurvy and other deficiency diseases, and there have been more ample opportunities for observing outbreaks of scurvy clinically than for many years past. Valuable experimental work in guinea-pigs and monkeys was carried out by Harriette Chick, E. Margaret Hume, Ruth F. Skelton, and Alice Henderson Smith,¹ concerning the relative content of the antiscorbatic principle in limes and lemons. Their findings are given below in the Royal Society's memorandum on scurvy, which was based to a large extent on their researches.

Though fresh lemon-juice is a very serviceable means of preventing the onset of scurvy in those who are debarred from getting ordinary fresh foodstuffs, there are other means of attaining the same end. Wiltshire,² for example, has demonstrated the value of **Germinated Beans**, both in the prevention and the cure of scurvy. The beans have the advantage that they can be carried dry for long periods without going wrong in the way that lemons do, and they were found to be of particular value in the Serbian campaign. The method of producing germination is described below.

Alice Henderson Smith³ gives the history of the use of spruce, sweetwort, and ordinary beer in the prevention of scurvy; from which it appears that, whereas the simple malt liquors and fermented drinks of long ago were prepared in such a way as to retain much antiscorbatic principle, modern beer made from killed malt has lost these properties, and is not in any measure a preventive of scurvy.

Stefansson⁴ reports upon careful tests concerning the extent to which the antiscorbatic qualities of fresh foods diminish or disappear when the same foods are treated by preservation—canning, pickling, drying, or bottling. He confirms the fact that bottled lime-juice fails to prevent scurvy, and shows that not only do preserving processes which involve the application of heat to the foodstuffs—such as canning or bottling—but also those which do not necessitate much heating of the foods—desiccation, for example—reduce the antiscorbatic properties of foodstuffs almost to zero. Fresh potatoes will prevent scurvy, but in his expedition desiccated potatoes failed to do so. He denies that cooking equally lessens the antiscorbatic value of most or all foods, but if the cooking is at all prolonged, the antiscorbatic value of the foods is destroyed. Three average raw potatoes may definitely turn the tide of scurvy that has not reached an extreme stage, but a similar ration of potatoes when cooked has a very much slower effect in relieving scurvy. On the other hand, meat and fish, slightly or even well advanced in the process of ordinary putrefaction, seems when uncooked to be as good an antiscorbatic as fresh fish, or nearly so. Curiously enough, moreover, bodily cleanliness and ventilation seem to have little bearing on the incidence or severity of scurvy, in which connection it is instructive to compare the filth and good health of Nansen, as described in *Farthest North*, with the immaculate Scott expeditions and their numerous scurvy cases. Stefansson also emphasizes the slowness with which scurvy develops, and he regards dizziness on standing up, and ready bleeding from the gums, as amongst the earliest symptoms noted as a rule.

In view of the fact that outbreaks of scurvy have recently been common both in this country and abroad in His Majesty's Forces, and in order to guard against a recurrence of such outbreaks, especially at places far removed from sources of supply, the Royal Society Food (War) Committee publish the following data concerning the causes and prevention of scurvy, based chiefly upon investigations carried out at the Lister Institute⁵ :—

Scurvy, like beri-beri, is a 'deficiency disease', and is due to the long-continued consumption of food lacking in an accessory food substance or

vitamine. The view that scurvy is due to tainted food must be abandoned. This vitamine is contained in a number of fresh foods; in largest amount in oranges, lemons, and fresh green vegetables; in considerable amount in roots and tubers, such as swedes, potatoes, etc.; and in small quantities in fresh meat and milk. It is deficient in all dried and preserved foods. It is destroyed by prolonged heating, such as takes place during stewing. Thus, potatoes in stews would be devoid of vitamine, but if boiled rapidly will still contain some quantity. Alkalies rapidly destroy antiscorbutic properties. Therefore soda should not be added to the water in which vegetables are soaked or boiled.

Before the onset of definite symptoms of scurvy, there is a period of debility and weakened resistance to disease. The occurrence of cases of debility in any body of troops without sufficient cause should at once direct the medical officer's attention to the sufficiency of the diet.

West Indian lime-juice, as ordinarily prepared, is useless for the prevention of scurvy. Fresh limes have an antiscorbutic action, but their efficiency is only one-fourth that of lemons. The so-called 'lime-juice', by the regular administration of which scurvy was eliminated from the Navy during the first half of the nineteenth century, was really lemon-juice obtained from the Mediterranean. The history of Arctic exploration affords numerous examples in which scurvy was prevented for long periods of time by the agency of lemon-juice regularly taken. Nares's expedition of 1875, notorious for the serious outbreaks of scurvy encountered, was the first to be provisioned with 'lime-juice' prepared from West Indian limes. Orange-juice is as effective as lemon-juice.

Potatoes and root vegetables have a distinct value in the prevention of scurvy—much less, however, than green vegetables or fresh fruit juices. A daily ration of 14 ounces of potatoes, boiled rapidly but not stewed, will suffice to prevent scurvy.

Pulses—beans, peas, and lentils—in the dried condition have no antiscorbutic properties. If, however, the dried seeds are soaked in water and are allowed to germinate for a short period—one or two days—they develop the antiscorbutic vitamine. At the same time these pulses are also rich in the vitamine which prevents beri-beri, and are, moreover, valuable foods.

The method adopted for germination is as follows: The beans, peas, or lentils are soaked in water at room temperature (60° F.) for twenty-four hours. The water is then drained away, and, to permit germination, the soaked seeds are spread out in layers, not exceeding 2 to 3 in. in depth, and kept moist for a period of about forty-eight hours at ordinary room temperature. They should not be allowed to dry after this operation, but should be cooked as rapidly as possible (lentils twenty minutes; peas, forty to sixty minutes).

The antiscorbutic value of fresh meat is very low in comparison with that of fresh vegetables and fruit. If fresh meat is consumed in large quantities, 2 to 4 lb. a day, scurvy will be prevented. Tinned and preserved meats possess no antiscorbutic value. Frozen meat, while more valuable than preserved meat, must be considered inferior to freshly killed meat in this respect.

The destruction of the antiscorbutic properties depends rather upon the time than the temperature employed. All foods, especially vegetable, should be cooked for as short a time as possible, at boiling point. Slow methods of cooking, such as stewing with meat or simmering below boiling point, should be avoided. Potatoes should be plunged into boiling water, and the boiling continued for twenty to thirty minutes after the boiling point has again been reached. Frozen meat should be roasted when practicable.

Summary of Measures recommended for the Prevention of Scurvy when Fresh Vegetables are unobtainable:—

1. The lime-juice ration should be replaced by lemon-juice. The ration should be 1 ounce daily served with sugar.

2. Cooked germinated peas, beans, or lentils should form part of the regular daily ration.

3. Attention should be paid to the methods of cooking employed, as set forth above.

COMPLICATIONS OF SCURVY.—Blatt⁶ made a special study of *ocular complications* in 70 patients suffering from scurvy; 12 complained of night blindness, though only in 8 could it be demonstrated by Förster's photometer; 3 had hæmorrhages in the eyelids; 5 subconjunctival hæmorrhages; 2 superficial keratitis; 3 retinitis with hæmorrhages; and 2 changes in the visual field consisting in concentric narrowing of the visual field for white in one case, and for red and green in the other. The relationship of night blindness or hemeralopia to scurvy is also emphasized by Hift,⁷ who, during his imprisonment in Siberia in 1915-17, had numerous opportunities for seeing cases of scurvy in various prisoners' camps in which outbreaks of night blindness existed simultaneously. Most of the cases of scurvy suffered sooner or later, and for a longer or shorter period, from night blindness; though, on the other hand, by no means all the cases of night blindness presented typical symptoms of scurvy. No objective changes in the eye were detected by him. Night blindness was no indication of scorbutic hæmorrhage in the retina; every case of night blindness, whether it had lasted for days, weeks, or months, was very rapidly curable by the administration of **Liver or Liver Oil**, without any other changes being necessary in the patient's mode of life.

A striking feature of many of the cases that S. W. Schulhof⁸ has met with in repatriated prisoners from Russia has been the occurrence of *rheumatoid affections* and *muscular atrophy* following scurvy. The pains in the limbs and joints developed as a rule three to six weeks before the hæmorrhagic manifestations; the latter usually appeared simultaneously on the gums and on the legs, though most of the patients were already confined to bed or unable to walk before the gum condition became typical. When placed under improved conditions of dietary, the hæmorrhagic tendencies ceased speedily, and the patients presented many of the appearances of subacute or muscular articular rheumatism only; this was often so severe as to prevent the patients from walking. This trouble in the joints and muscles in scurvy may be of very considerable importance in regard to the patient's future, and there seems little doubt that it, like the hæmorrhagic tendencies and spongy gums, is the result of the dietary being deficient in vitamins. The diet of Schulhof's patients during their imprisonment had consisted almost exclusively of inferior bread, salt fish or tinned meats, and groats, and they had never any vegetables, fruit, or potatoes; and Schulhof thinks it probable that some at least of the more obscure non-infective rheumatoid conditions met with in peace-time in civil life may be due to similar avitaminosis—a suggestion of importance in connection with the dietaries of subjects of these affections.

REFERENCES.—¹*Lancet*, 1918, ii, 735; ²*Ibid.* 811; ³*Ibid.* 813; ⁴*Jour. Amer. Med. Assoc.* 1918, ii, 1715; ⁵*Brit. Med. Jour.* 1918, ii, 606; ⁶*Med. Supp. Rev. Foreign Press*, 1919, Jan., 30; ⁷*Ibid.* 1918, i, 32, 97; ⁸*Wien. klin. Woch.* 1918, and *Med. Supp. Rev. Foreign Press*, 1918, Oct., 349.

SCURVY, INFANTILE. (See also DEFICIENCY DISEASES; INFANT FEEDING; VITAMINES.) *Frederick Langmead, M.D., F.R.C.P.*

J. Comby¹ states that infantile scurvy is comparatively frequent in Paris, and has himself seen 55 cases. He ascribes its first appearance to the use of sterilized milk introduced in 1889, and subsequent cases to humanized and homogenized milk. It may be laid down as an axiom that every child brought

up on sterilized food for several months together, to the exclusion of living fresh articles, is threatened with infantile scurvy.

[The reason for this is conclusively shown, by the recent work on the necessary food factors, to lie in the absence of the particular factor, *Water-soluble C*.—F. L.]

DIAGNOSIS.—Of Comby's 55 cases, 45 had previously been incorrectly diagnosed. The chief points in diagnosis emphasized by him are: (1) The age of the patient—i.e., between 6 and 18 months; (2) The previous feeding—on artificial foods; (3) The painful pseudo-paralysis of the lower limbs; (4) Diaphyseal swelling of the tibia or femur; and (5) Spongy, bleeding gums.

TREATMENT.—Comby advocates the following treatment: The child is left in its cradle, not moved, rubbed, bathed, or dressed, in fact avoiding every kind of movement for the first few days. Every sort of prepared milk is discarded, once and for all, plain boiled milk being given in its place. A teaspoonful of **Grape-juice** is given twice a day. In winter he prescribes **Orange-juice** instead, or, failing that, a little diluted sweetened **Lemon-juice**. In somewhat older children a few spoonfuls of mashed potatoes may be given.

[This treatment is on old, well-tested, and successful lines.—F. L.]

H. Chick and M. Rhodes² have carried out inquiries which establish the proportionate values of fruit and vegetable juices commonly employed, and add one—**Swede-juice**—which should prove especially useful in the case of the poorer class of patient. Cow's milk, they show, possesses distinct antiscorbutic properties, but only in a small degree in comparison with other antiscorbutic foodstuffs; its value being further reduced by heating and drying, it is advisable to provide additional antiscorbutic material for infants fed on heated or dried milk. Among fresh fruit-juices, that of the orange is easily the most suitable, and possesses a value about ten times as great as that of fresh grapes. Of the raw vegetable-juices examined—swede, carrot, beetroot, cabbage leaves—raw swede-juice proved to be by far the most potent, approximating in value to raw orange-juice. The raw juice of carrots was found to be much inferior, and that of beetroot failed to prevent scurvy in the largest dose (20 c.c. daily) that could be administered to the experimental animals. A. Harden, S. S. Zilva, and G. R. Still³ have employed a form of **Lemon-juice** from which the free citric and other acids have been removed. It appears to retain almost all, if not all, the original antiscorbutic value of the juice, is but slightly acid, and contains about 15 mgrms. of solids per c.c. The preparation can be concentrated in bulk to any desired volume, or even be evaporated to dryness, without losing its antiscorbutic potency. In three cases in which it was employed, rapid recovery followed; in a fourth there were extensive subperiosteal hemorrhages, so that the process was necessarily slower, but yet was unusually rapid as compared with similar cases treated by ordinary methods.

The outstanding feature of the treatment is that the antiscorbutic factor is given separated from the greater part of the inert components of the food-stuff in which it occurs. Moreover, it is given in a concentration at least double—in one case seven times—as strong as that in which it occurs naturally in the foodstuff (lemon) from which it was obtained. One special advantage over unmodified fruit-juice is that the dose of the latter is limited by its liability to cause digestive disturbances, especially diarrhoea. By the larger dosage possible, recovery is even more rapid than before.

REFERENCES.—¹*Med. Press and Circ.*, 1919, i, 83; ²*Lancet*, 1918, ii, 774; ³*Ibid.* 1919, i, 17.

SCHISTOSOMIASIS. (*See* BILHARZIASIS.)

SEA-SICKNESS.*Herbert French, M.D., F.R.C.P.*

Drugs of various kinds have in the main proved unsuccessful in even lessening a tendency to severe sea-sickness, and it will be interesting to learn whether others confirm the experience of Major Lemon¹ in connection with the value of packing the external auditory canals firmly with sterile gauze with the aid of a match. He himself was suffering acutely from sea-sickness at the time, but found that it took only a few minutes to get immediate relief from thus stuffing each ear tightly enough to cause a decided sense of pressure against the drum. He used the same procedure in 200 cases on board his troop-ship, and always with the same success; moreover, he found that in several cases in which, after the sea-sickness had been relieved for several hours, the packing was removed from the ears, the sea-sickness then at once returned, but was again relieved by repacking the ears.

REFERENCE.—¹*Med Press and Circ.* 1919, Aug. 6, 108.

SHOCK.- SURGICAL.*A. Rendle Short, M.D., F.R.C.S.*

This subject was dealt with in considerable detail in the MEDICAL ANNUAL, 1919, and it will therefore suffice to pass in review the principal contributions of the year which enlarge our knowledge or make new suggestions, without staying to notice the numerous general reviews, good examples of which are the discussion at the Royal Society of Medicine¹ on Jan. 23, and the British Medical Association Meeting² on April 10, both opened by Professor Bayliss and Dr. Dale; and Professor Quénu's long article in the *Revue de Chirurgie*,³ and Cowell's Arras and Gale Lecture.⁴

The Phenomena of Shock.—Captain N. M. Keith⁵ reports observations on the blood-volume of wounded soldiers suffering from the shock-hæmorrhage complex, investigated by his vital-red method. Ten c.c. of the dye, which is non-toxic, is injected into a vein as a 1.5 per cent solution, and after five minutes blood is withdrawn and the red tint of the plasma compared with a standard. The estimated blood-volume varied from 52 to 85 per cent of the normal, while the plasma was reduced to 62 to 90 per cent. When 800 c.c. of blood was taken from a donor for transfusion, the total blood-volume was rapidly made up to normal, even within an hour, so that there is obviously some factor in shock which hinders blood regeneration. Keith groups the cases as follows: (1) Less severe cases, blood-pressure above 95 mm., blood-volume over 75 per cent of normal; (2) Serious cases, blood-pressure below 90 mm, blood-volume 65 to 75 per cent of normal; (3) Dangerously ill, pulse imperceptible, blood pressure below 60 mm., blood-volume 50 to 65 per cent. Recovery almost impossible. [I have found the total blood-volume in a fatal case of shock-hæmorrhage as low as 3 pints.—A. R. S.]

Erlanger and Gasser,⁶ working with animals in a state of shock experimentally produced, find that the blood-volume usually falls to about 80 per cent of the normal. Their observations were not complicated, as were Keith's, by the hæmorrhage factor. They point out, however, that loss of blood volume is not due to a mere loss of water passing out of the plasma into the tissues. There is no increase of the red corpuscles or proteins in the circulating blood. [The reviewer pointed out in 1913 that the specific gravity of the blood does not alter.—A. R. S.] Indeed, the proteins may be reduced in percentage. Evidently, therefore, what happens is that much of the blood is in a backwater, no longer circulating. They find that in animals the capillaries in the intestinal villi are gorged with stagnant blood. Turck gives pictures of this condition. In Keith's cases, of course, the hæmorrhage factor accounts for a good deal of the reduction in the blood-volume, but if a considerable part of the circulatory blood, on account of the shock element, had become stagnant in the capillaries, the vital-red would not reach it, and the figure would be too low.

Cannon,⁷ and also Robertson and Bock,⁸ have shown that there may be such a stagnation of the corpuscles in the capillaries as to lead to an increased red-cell count in capillary blood as compared with venous blood. [This undoubtedly occurs, but is by no means constant. It was not present in my recent case referred to above, nor in several of my shock cases in France.—A. R. S.]

Cannon gives details of his animal experiments showing that shock, or a shock-like condition, can be produced by damaging the tissues, especially the muscles, and allowing absorption by the veins of the crush-products. He attaches great importance, therefore, to an aseptic chemical poisoning in these cases. This is the view of shock held and defended by Quénu and others. The practical deduction is that amputations ought to be performed before the tourniquet is loosened. [This theory was discussed in the MEDICAL ANNUAL, 1919.]

TREATMENT.—Turck,⁹ accepting the view that shock is due to flooding of the circulation with peptones produced by autolysis of the damaged tissues, advocates the use of an **Antitoxin** protecting against such bodies, and claims some encouraging results both in man and animals. Apparently the same serum also works wonders in cases of pneumonia, gastric ulcer, neuritis, rheumatism, etc. "Nearly all these cases are now permanently cured"!

Erlanger and Gasser, finding that Bayliss's gum infusion does very little good in cases of experimental shock in animals, have been using a 25 per cent solution of **Gum** in 18 per cent **Glucose**. This gives much better results in animals, but in human cases the benefit does not seem very impressive, though undoubtedly they put it to a very severe test by employing it only in desperate circumstances. It must be very difficult to handle such a viscid solution.

Dunet¹⁰ quotes good results from intravenous injections of **Saline heated to 55° C.** to overcome the well-known ill effects of cold.

Opinion differs a good deal as to whether Bayliss's **Gum Solution** (6 per cent gum acacia in 0.9 saline) is as good as a blood transfusion in the treatment of shock-hæmorrhage. It is quite certain that after the lapse of many hours, during which the nerve cells in the brain have lost their Nissl granules, even blood transfusion fails.¹¹

Robertson and Bock show that the regeneration of blood after a hæmorrhage can be hastened considerably by **Forced Fluids**, that is by introducing as much fluid as possible, both by the mouth and the rectum.

(See also **Blood Transfusion**, p. 4.)

REFERENCES.—¹*Lancet*, 1919, i, 256; ²*Ibid.* 1919, i, 668; ³*Rev. de Chir.* 1918, Sept.-Dec., 204; ⁴*Lancet*, 1919, ii, 137; ⁵*Med. Research Committee's Special Report*, 27; *Lancet*, 1919, ii, 159; ⁶*Ann. Surg.* 1919, April, 389; ⁷*Jour. Amer. Med. Assoc.* 1919, July 19, 174; ⁸*Jour. Exper. Med.* 1919, Feb., 139, 154; ⁹*Med. Rec.* 1919, Mar. 22, 471; *N.Y. Med. Jour.* 1918, Nov. 28, 901; ¹⁰*Presse Méd.* 1919, June 12, 323; ¹¹*Brit. Jour. Surg.* 1919, Jan., 402.

SKIN ERUPTION ATTRIBUTED TO MERCURIC CHLORIDE. (See DRUG ERUPTION.)

SKIN, INFECTIVE CONDITIONS OF. E. Graham Little, M.D., F.R.C.P.

TREATMENT.—De Herain¹ recommends the following ointment for ringworms, boils, infected wounds, soft chancres, etc.: **Copper Sulphate 2, Zinc Oxide 15, lanolin 10, vaseline to 100.** For milder infections—e.g., acne, impetigo—the quantity of copper sulphate should be one-tenth of the above strength.

Staphylococcic Infections.—In an article on the reinforcement of certain drugs by the addition of lipoids, Hudelo, Montlaur and Drouin² show how the specific action of tin and its salts on the staphylococcus can be reinforced by

PLATE XXXIII.

MULTIPLE ENDOTHELIOMATA OF THE SKIN



Fig. 1.—Endothelioma cutis. Case 1, side view of patient.



Fig. 2.—Endothelioma cutis. Case 2. The eruption closely resembled cuticular pigmentosa.

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the addition of a lipoid medium. Forty-five cases of various staphylococcal affections, including furunculosis, sycosis, pyoderma, axillary abscess, and acne, were treated by subcutaneous injections of **Lipoid Solution containing Tin**. The treatment was most successful in furunculosis, all the 37 cases being cured after a course of five to six injections, and least effective in acne, although the four cases in which it was tried showed a definite improvement. The characteristic features of the treatment were the absolute painlessness of the injections, the almost total suppression of pain in the lesions, the entire absence of a general reaction, a frequent local reaction at the site of the lesions resembling Herxheimer's reaction, and a rapid and absolute cure of all the acute elements of the eruption.

Bory finds **Xylol** useful in skin affections (*p.* 13).

REFERENCES.—*Presse Méd.* 1918, 555; *Med. Supp. Rev. Foreign Press*, 1919, April.

SKIN, NEOPLASMS OF.

E. Graham Little, M.D., F.R.C.P.

Van Beuren¹ reports on the examination of 350 new growths of the skin, which are thus classified by him.

1. Tumours upon the skin :—

1. Papillomata	..	..	..	44
2. Epitheliomata	{ Basal cell	58	..	122
	{ Squamous cell	61	..	
	{ Papillary type	3	..	
				166

2. Tumours in the skin :—

1. Fibromata	..	..	..	38
2. Sarcomata	..	..	..	24
3. Pigmented moles	..	..	..	28
4. Melanocarcinomata	..	..	..	12
5. Keloids	..	..	..	9
6. Granulomata	..	..	..	7
7. Fibro-epithelial or composite tumours	..	..	..	3
8. Capillary angiomata	..	..	..	2
				123

3. Tumours beneath the skin :—

1. Angiomata (cavernous type)	..	..	20
2. Lipomata	..	..	5
3. Sebaceous cysts	..	..	18
4. Implantation cysts	..	..	15
5. Dermoid cysts	..	..	5
6. Carcinoma metastasis	..	..	1
			64

For clinical purposes all new growths upon the skin not epitheliomata may be classed as papillomata. The main clinical distinctions between the innocent and malignant surface tumours is found in two factors, the rate of growth (rapid in mischievous, slow in benign tumours) and the development of ulceration. It is a good working rule that if the tumour has grown since first noticed, it should come out.

Multiple Endotheliomata of the Skin.—Wise² has a valuable and full summary of the literature of endothelioma, a subject of much controversy at the present time, and contributes full notes, including histological illustrations, of two cases of multiple skin growths. The first was in a man, age 32, who had very numerous (about 150) papular and mole-like lesions distributed on the chest, back, arms, thighs, and neck (*Plate XXXIII, Fig. A*). There were no subjective symptoms, the skin covering the tumours was unaltered in colour and character, and the clinical diagnosis hesitated between syringocystadenomata and soft moles. The second case was in a Hebrew

infant of 22 months, and the clinical diagnosis made by "a dozen competent dermatologists" was urticaria pigmentosa (*Plate XXXIII, Fig. B*). Histological examination, however, showed that the tumours were composed of endothelial cells, and the sections of the two cases, though so widely different clinically, were difficult to distinguish. Endothelial tumours, for the dermatologist, have usually meant the turban-like masses of the scalp described by Ancell and Spiegler, and it is a surprise to find so radically different a clinical type with this histology. Wise quotes with approval Zeit's criteria for the distinction of endothelial tumours from epitheliomata and carcinomata, and these are appended:—

1. The tumour cells in endothelioma are intimately connected with the stroma, and cannot be brushed out of it, as in the case of carcinoma, in which the epithelial cells may also retract from the stroma and show spaces.

2. Endothelial cells produce intracellular cement substance and are closely packed together, whereas the epithelial cells in carcinoma have no intercellular substance and form no compact layers.

3. In endothelioma, delicate fibrillar processes extend from the walls of the alveoli into the proliferated cell masses. They are absent in carcinoma.

4. In endothelioma the cell masses consist of a dense mosaic of many layers of cells, with small, sharply outlined nuclei, surrounded by a broad envelope of clear, glassy perinuclear protoplasm. Carcinoma cells have large vesicular nuclei, with a moderate amount of perinuclear protoplasm, more or less granular.

5. In endothelial tumours the cells are arranged in the form of cellular cords and cylinders (round masses in carcinoma), and may separate out hyaline material (cylindroma) or form lumina-like masses (sieve-like) in the cellular cords, due to secretory processes of endothelial cells.

6. To distinguish the endothelial tumours from sarcomata, it is to be remembered that the former have an organoid and the latter a histoid structure. According to this definition, every large-cell sarcoma with a well-developed stroma which was formerly called alveolar sarcoma would be called an endothelioma.

REFERENCES.—¹*Surg. Gyn. and Obst.* 1919, March, 278; ²*Amer. Jour. Med. Sci.* 1919, Feb., 236.

SKIN, TRANSVERSE STRIÆ OF. E. Graham Little, M.D., F.R.C.P.

D'Oelsnitz¹ has recently observed 70 cases of transverse striæ in the skin of the lumbosacral region in various military hospitals. Half the cases were associated with morbid conditions, such as bent back and obstinate sciatica or other diseases which caused the trunk to assume a permanent or intermittent vicious attitude. In the other half, in which there was no morbid cause to explain their production, the striæ were generally found in persons who had been engaged in special occupations, such as farm labourers, blacksmiths, and generally speaking all trades in which permanent or intermittent stooping had caused an unusually intense or repeated traction of the skin of the lumbosacral region. To these etiological causes, which are insufficient in themselves, must be added a factor of individual predisposition which is probably an abnormal fragility of the elastic tissue of the dermis.

REFERENCE.—¹*Bull. et Mém. Soc. Méd. d. Hôp. de Paris*, 1918, 3 ser. 42, 942 (abstr. in *Med. Supp. Rev. Foreign Press*, 1919, Feb., 85).

SKIN, TUBERCULOSIS OF. (See also ACNE SCROFULOSORUM; TUBERCULOUS DERMATOMYOSITIS.) E. Graham Little, M.D., F.R.C.P.

Stokes¹ has two important papers dealing with the significance and treatment of some eruptions, including purpura, erythema multiforme, and especially erythema nodosum (q.v.), which are at least sometimes of tubercu-

lous causation, and should put the practitioner on the watch for further manifestations.

Gauvain² has made a study of the effects of **Copper Preparations** in the treatment of tuberculosis, and visited Germany shortly before the war to investigate the use of a combination of copper, lecithin, and cinnamic acid called *lecetyl*, used locally, and diamide glycecol copper, injected intravenously. The war interrupted these studies, and in 1917 Ellis devised a combination which Gauvain pronounces to be superior in its effects to the results he had observed in Germany with *lecetyl*. The brass paste is to be applied every two or three days under zinc plaster. The 'brass oil' is used either soaked in gauze as a foment under jaconet coverings, and kept on for two to seven days, or simply painted on, and the latter procedure is specially recommended for tuberculous glands and scrofuloderma. The warning is given that the preparations must be used fresh, as the combinations are unstable. For facial sites, adrenalin and cocaine may be mixed with the preparations with advantage. (*See also BRASS PREPARATIONS, p. 5.*)

Stopford Taylor³ reports remarkable improvement resulting from the intravenous injection of **Kharsivan** and **Neokharsivan** in two cases. The dose is not stated, but was given at weekly intervals. In the first case, of tuberculous skin ulcers, five injections (combined with the application of light by **Kromayer's Lamp**) effected healing. In the second case, lupus with enlarged glands, Kromayer's lamp alone did not produce much result, but after three injections of neokharsivan the healing was rapid.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1919, Feb., 157, and March, 313; ²*Lancet*, 1919, March 15; ³*Brit. Med. Jour.* 1918, ii, 431.

SMALL-POX.

J. D. Rolleston, M.D.

EPIDEMIOLOGY.—In the Milroy Lectures on "Half a Century of Small-pox and Vaccination", J. C. McVail¹ points out that in the days before vaccination, small-pox was a disease of normally high fatality, with occasional outbreaks of a very mild character. In the nineteenth century the two greatest epidemics of small-pox were those of 1837-41 and 1870-73. In 1838 Gregory reported 694 cases at the London Hospital for Small-pox, with 188 deaths, a mortality of 27.1 per cent. In the pandemic of 1870-73, the mortality ranged from 18.6 per cent in the metropolitan area to 21.6 per cent in Cork Street Hospital, Dublin. During the last half century, with the exception of the metropolitan epidemic of 1901-2, there has been a great diminution in the fatality, infectivity, and prevalence of small-pox. Since the beginning of the twentieth century, two different types of small-pox have occurred simultaneously in Great Britain: the one is the European or African type, which originated in North Africa and thence spread to Spain, France, Italy, and London, and is attended with a comparatively high mortality, ranging from 16.8 to 24.7 per cent; the other is an American type, which was prevalent during the same period in the United States, Canada, and New South Wales, and in the provinces in England, with a mortality as low as 0.45 to 5 per cent.

MORBID ANATOMY.—Koch and Wätjen² describe their post-mortem observations on 26 cases of small-pox during an epidemic at Bucharest in 1918. A distinction between *variola vera* and *purpura variolosa* was justified not only on clinical, but also on pathological grounds. In *purpura variolosa* hæmorrhages were constant in the serous membranes, and the mucous membranes of the nasal fossæ and accessory sinuses, mouth, and fauces, together with necrosis of the epithelium. Hæmorrhages in the bone-marrow, mucous membranes of the large intestine, female genitals, and urinary tract, completed the picture of the hæmorrhagic diathesis. The spleen was not enlarged, and did not show

septic softening. No essential changes were found in the other organs on naked-eye examination. In *variola vera*, in addition to the skin eruption, there were pocks on the mucosæ of the mouth, accessory sinuses, larynx, trachea, and bronchi. In several cases the œsophagus was affected also. The mucous membranes of the throat and upper respiratory passages in every case showed more or less extensive superficial or deep necrotic processes and lesions resembling noma, caused by mixed infections, especially streptococci, streptobacilli, streptothrix, leptothrix, fusiform bacilli, and spirilla. In every case of *variola vera*, and in one of *purpura variolosa*, the kidneys presented a nephritis resembling that of scarlatina. In *variola pustulosa hæmorrhagica* internal hæmorrhages were found as in *purpura variolosa*. In addition to the danger of general infection, the patients were exposed to local complications, such as œdema of the glottis, laryngeal stenosis, purulent bronchitis, bronchopneumonia, lobar pneumonia, and pulmonary gangrene.

SYMPTOMS.—Kathe³ reports 4 cases of *small-pox without eruption* in recently vaccinated soldiers. The symptoms were the same in all, viz., an onset with shivering, followed next day by violent headache, very severe pain in the back and limbs, and loss of appetite. As there was no eruption, the cases were at first regarded as influenza; but the exposure to infection and almost simultaneous onset in all four cases showed that the disease was small-pox. Apart from the question of the virulence of the small-pox virus, the non-eruptive form may depend on a congenital resistance such as occurs in epidemics of any infectious disease; but it is chiefly due to acquired immunity from successful vaccination.

VACCINATION AND VACCINIA.

Vaccination.—Vaccination by subcutaneous injection, which was practised in India by Fearnside and Poi (see MEDICAL ANNUAL, 1919, p. 462), is recommended by J. R. Goodall,⁴ who employed it in about 6000 cases. From one-half to three-quarters of a vaccine tube is used for each individual. Sufficient sterile water is added to the vaccine to make each injection equal to 1 c.c., which is then injected into the arm subcutaneously. The local reaction, which resembles that following typhoid inoculation, sets in usually between the second and fourth days, but in a few cases may be delayed till the twelfth or even fifteenth day. The general symptoms do not differ from those of ordinary vaccination, and are just as variable in intensity. About 8 per cent of Goodall's cases proved ineffective. The following advantages are claimed for the method: (1) It is a clean surgical operation; (2) There is no open wound, and dressings are therefore not required; (3) Dangers of secondary infection are practically eliminated; (4) The percentage of positive reactions is very high; (5) In only a small percentage of cases the local and general symptoms caused complete incapacity; (6) It is painless compared with scarification; (7) Children undergo hypodermic vaccination without any difficulty, owing to the rapidity with which reinjection is carried out.

Generalized Vaccinia.—All statistics are agreed as to the rarity of this affection. According to Chauveau, only 6 to 8 cases occurred in France among 500,000 to 600,000 persons vaccinated. In Denmark, Haslund states that there were 4 cases among 39,915 vaccinations between 1888 and 1898. In Germany, Vogt saw only five examples among 100,000 vaccinations, and Grobe only 50 to 60 among 2,285,579 vaccinations. Generalized vaccinia as a rule runs a mild course; but when there is a mixed infection, with exudative dermatoses, especially eczema, prurigo, or impetigo, the condition tends to be much more severe. Anders⁵ reports a fatal case in a man, aged 23, who was in an extremely ill-nourished condition, but, apart from a boil on the right

shoulder, did not present any skin lesions. Owing to a case of suspected small-pox, he was vaccinated on the right arm on April 14, and on April 18 developed pneumonia; on the 21st four large vesicles were present at the vaccination site, with inflammatory oedema of the surrounding skin. Vesicles were also present on the face, chest, abdomen, and extensor surface of the limbs, especially the hands. During the next few days the temperature kept high and the general condition became worse. Death took place eleven days after vaccination. The necropsy showed vaccinal pocks on the skin and mucous membranes of the mouth and trachea, as well as the ordinary lesions of septicæmia. The diagnosis of vaccinia was confirmed by Anders developing a typical vaccine vesicle on the wrist seven days after the post-mortem examination.

REFERENCES.—¹*Brit. Med. Jour.* 1919, i, 297; ²*Med. Supp. Rev. Foreign Press*, 1919, 171; ³*Ibid.*; ⁴*Lancet*, 1919, ii, 286; ⁵*Zeits. f. Hyg.* (abstr. *Lancet*, 1919, i, 906).

SPINAL CORD INJURIES.

J. Ramsay Hunt, M.D.

Operative Treatment.—Marburg and Ranzi,¹ of Prof. von Eiselsberg's clinic in Vienna, publish a detailed account of 142 cases operated upon for spinal-cord injury. About two-fifths of the 142 cases were admitted between one and five weeks after the injury, the remaining three-fifths after a longer period of time. The chief positive indications for laminectomy were gained by *x*-ray examination, when a projectile or fractured vertebra was seen to have encroached upon the vertebral canal and was presumably compressing the spinal cord. Laminectomy then should be done as soon as the general condition of the patient, including complications, renders it probable that he will survive the operation. The persistence of shock, and such complications as hæmothorax, contra-indicate laminectomy; indeed, early laminectomy seems to be entirely contra-indicated. Operation should also be postponed in face of advancing bedsores, cystitis, and nephritis; also suppurating sinuses require preliminary treatment. When the indications afforded by an *x*-ray examination are positive as to the existence of compression, then the clinical evidence of absolute loss of motion, sensation, and reflexes should not be held to bar the operation, granted that the general condition of the patient is satisfactory. If a bullet has become impacted in the body of a vertebra without causing signs of compression, it should be left alone. It is in the class of cases in which there is nothing discernible on *x*-ray examination that the indications for laminectomy are difficult to define. The lesion which can be relieved most satisfactorily is a collection of cerebrospinal fluid, whether diffused widely or forming a circumscribed arachnoid cyst. The result following excision of a scar in the dura mater is the more uncertain in proportion as the scar tissue involves the pia mater and the superficial layers of the spinal cord. A pachymeningitis involving only the nerve roots or the strands of the cauda equina may be excised and divided nerves sutured, possibly with benefit. The difficulty is to decide beforehand whether there is a likelihood that the above conditions may be met with. Signs of complete paraplegia below the lesion, in the absence of any indications furnished by the *x*-ray examination, contra-indicate laminectomy. In the case of partial lesions, improvement should be awaited for two months. A failure to improve, an arrest in the course of improvement, and an aggravation of the spinal lesions, may suggest laminectomy in order to remove fluid or scar tissue. Of the 142 cases submitted for laminectomy, 42 had died by the time the report was written—9 shortly after the operation from complications connected with the wound, and 5 from pneumonia; the rest from ascending nephritis and bedsores. During that same period 41 had shown definite improvement. Other cases of partial improvement were able

to move about with the aid of apparatus, but were not free from urinary complications. When the patient's only trouble was urinary—incontinence, retention, automatic emptying of the bladder—no relief followed laminectomy.

Symptomatology of Traumatic Section of the Spinal Cord.—This subject, dealt with by various observers during the war, is reviewed by Deniker.² Complete transverse lesions in the cervical region are usually fatal, and lesions in the lumbosacral region destroy the automatic spinal centres. Dorsal lesions are characterized by two stages: (1) *Shock*, in which the tendon reflexes are abolished and the skin reflexes are altered. The abdominal and cremasteric reflexes are absent; occasionally the cremasteric may be present. There is a plantar reflex of flexion, but this is slower than normal; at times the Babinski reflex is elicitable. During this stage there is a persistence of the excitability of smooth muscle—viz., the dartos, the arrectores pilorum. The vasomotor *tache* is also preserved. There is complete anidrosis and retention of urine. Hæmaturia (vasoparalytic) and melæna may also be present. A peritoneal syndrome is occasionally observed, dependent upon a congestion of internal organs such as the liver, pancreas, etc. (2) The second phase of transverse spinal section is that of *spinal automatism*. This does not appear before the fifth or sixth week. This is the period when the so-called reflexes of defence make their appearance and constitute a condition of irritable automatism which is apparently spontaneous but is due to minimal excitation—e.g., muscular tension, distention of the bladder, etc. The tendon-jerks return, a contralateral reflex may be present, and the plantar reflex is more active and is variable. *Sensations*: Subjectively there may be pain and a persistence of a certain degree of sensibility—e.g., vibratory sensation and sense of attitude are indications of an incomplete lesion. Subjective sensations are often deceptive in this respect, producing false images of posture and mental images of various poses.

The author states that regeneration of the fibre tracts of the cord does not take place after the divided ends of the cord are united, and that myelorrhaphy is a purely illusory procedure.

Many years ago Bastian stated that a complete transverse lesion of the spinal cord above the lumbar enlargement was followed by abolition of reflex action in the lower extremities—e.g., absence of the knee-jerks and plantar reflexes. Bastian's law, however, has steadily lost ground, especially in recent years. Claude and Lhermitte³ report a complete transverse section of the spinal cord at the level of the 9th dorsal segment resulting from a gunshot wound. The completeness of the division was verified at operation, when the divided cord was united by suture, and again at autopsy, the patient having survived the operation eight months. In spite of the complete section of the cord, knee-jerks reappeared six months after the onset of the affection and persisted till death; the plantar reflex on one side was extensor, contrary to what has been noticed in other cases. An extensor plantar reflex may therefore not be regarded as a sign of incomplete section. Defensive reflexes, automatic movements, and erection were distinct, indicating a functional activity and even an excitable state of the freed segments of the cord. As regards subjective sensibility, the patient frequently stated that he felt certain vague sensations in the feet. This apparently paradoxical occurrence has been observed by the writers in other cases of complete anatomical section, and resembles the hallucinations experienced by the amputated, and is probably due to stimulation of the central end of the divided cord.

The Practical Significance of the Mass-reflex in the Treatment of Injuries of the Spinal Cord.—This subject is further discussed by Riddoch.⁴ In 1917 a condition was described by Head and Riddoch⁵ in certain cases of grave injury

to the spinal cord which was called the 'mass-reflex'. The presence of this widespread reaction introduces many difficulties in the nursing and treatment of the afflicted patients.

The phenomenon. For a period, varying in uncomplicated cases from a few days to three weeks after the incidence of the spinal injury, the spinal cord distal to the lesion is under the influence of 'shock'. There are flaccid paralysis of skeletal muscles and loss of sensation in the affected regions of the body. The limbs lie motionless on the bed. The functional activity of all reflex arcs of the isolated segments of the cord is almost completely abolished. There is retention of urine and faeces, due probably, in the main, to tonic contraction of the internal sphincters, which are innervated by the sympathetic nervous system. The skin is dry. This has been called the 'stage of flaccidity'. As the effects of spinal shock pass off, reflex excitability returns; the paralyzed muscles recover tone, the bladder expels its contents at intervals, the rectum becomes automatic in its action, and an area of skin, varying with the level of the spinal lesion, may begin to sweat. This is the 'stage of reflex activity'. Now in a well-defined group of cases, especially where the spinal cord has been completely divided, a noxious stimulus, such as a scratch or a prick, applied to any paralyzed part evokes a flexor spasm. This consists of flexion at hip and knee, dorsiflexion at the ankle, and an upgoing movement of the toes, together with flexion of the trunk from contraction of the muscles of the abdominal wall, provided the lesion is high enough. With a stimulus of moderate strength it is, as a rule, bilateral, and if the stimulus is applied to a part in the middle line of the body, such as the penis, perineum, or bladder, both lower limbs flex simultaneously and the muscles of the anterior abdominal wall contract as a whole. Following the spasm the trunk and limbs resume their former posture, not from contraction of the extensor muscles, but from relaxation of the flexors and the action of gravity.

Flexor spasms. The defenceless patient, lying anchored in bed, is at the mercy of the strong involuntary flexor movements of the lower limbs and trunk which convulse him periodically. So violent may these spasms be that he is pulled hither and thither, and may even be thrown out of bed. These movements form part of the mass-reflex, and impulses arising from stimuli of noxious nature from any part of the paralyzed region of the body can evoke them. Tension on the muscles of the limbs, an over-distended bladder or cystitis, gastro-intestinal irritation, irritating bedsores, are all capable of evoking vigorous involuntary flexor movements.

The nursing and general treatment of paraplegic patients who exhibit the mass-reflex can be summarized shortly. The spinal cord below the lesion is exquisitely sensitive to impulses originating from the most diverse stimuli. The reaction evoked involves the whole paralyzed region, somatic and visceral, and is so uncontrolled and violent in character that it dominates the life of the unfortunate patient. Our endeavour should therefore be directed to allaying the excitability of the spinal cord by removing as many noxious influences as possible. The limbs and the viscera, such as the bladder and intestinal tract, must be treated with the greatest gentleness, and every care must be taken to avoid the generation of long-continued and violent mass-reflexes.

Treatment of Retention of Urine after Spinal Injuries.—This is the subject of an interesting study by Vellacott.⁶ In gunshot wounds of the spine with retention of urine, the surgeon's objectives as regards the urinary tract are two: (1) The avoidance of infection; (2) The establishment of a condition of automatic micturition, known as 'the automatic bladder', 'periodic reflex micturition', 'the infantile bladder', or 'active incontinence of urine'. The first is more important, since the second follows as a rule when infection is

avoided or is mild in nature. By the avoidance of urinary sepsis in cases of complete transverse lesion of the cord, the patient may be saved from pyelonephritis and early death. In cases with some prospect of recovery he may be saved from his most urgent danger and not deprived by a complication of his chance of cure. The general belief is that infection is carried as a rule by instrumentation, and this is borne out by the results of examination in the laboratory of specimens of urine taken on admission of the 50 cases of retention in the author's series. It follows that in most cases catheterization carries the first infection from the introducer's hands or the patient's glans penis or penile urethra. It is also possible that infective bacteria may be excreted by the kidneys or reach the bladder by the urethra without catheterization. Urine lying stagnant in the urethra owing to paralysis of the ejaculator urinæ may also be a contributing factor.

METHODS OF TREATING RETENTION.—While admitting the possibility of an auto-infection, the safest assumption for the surgeon is that infection as a rule is not due to this cause, and his aim must be to prevent the introduction of sepsis by any method adopted to relieve retention of urine. To avoid infection when catheterization is used, the first necessity is the carrying out of rigid and continued precautions. But under war conditions, in spite of every effort, in the majority of catheterized cases the urine was grossly infected when the patient reached the base hospital. The following methods aim at the complete avoidance of catheterization :—

1. *Distention and overflow.* By this method the bladder is allowed to distend until overflow takes place, no catheter being used. It is claimed that no infection of the urine occurs and that cystitis does not develop. It might be feared that the detrusor muscle would not recover tone, and that periodic voluntary micturition would not develop, but experiments on animals support the possibility of successful results.

2. *Expression of the urine.* Provided the sphincter is not spasmodically contracted, the bladder can be nearly emptied without difficulty. The evacuation is in some cases rendered more easy by preliminary stimulation of the soles of the feet, thighs, or lower part of the abdominal wall. The open hand is applied to the abdomen, and the distended bladder is gently grasped. Pressure is then made, combined with a squeezing movement. Much force must not be used. Micturition once started, the pressure may be relaxed a little, as the action often continues spontaneously. Assistance may sometimes be given by the patient breathing deeply.

Expression of severely infected bladders proved dangerous, and should, he thinks, never be attempted. Even moderate pressure may then rupture a thinned bladder wall, or the manipulation may aggravate existing cystitis or vesical hæmorrhage. As it probably also encourages regurgitation of urine into the ureters, in septic cases it should not be practised. When catheterization has not been resorted to, or when the urine is normal, expression has been successful. But as cystitis may undoubtedly come on without catheterization, and in view of the difficulties and dangers just enumerated, the adoption of this method can only be advocated in those cases in which it is easily accomplished and in which the urine is not infected.

3. *Early suprapubic cystotomy and drainage.* This has been suggested by Thomson Walker before catheterization. He advocated the insertion of a Pezzer's suprapubic catheter, and that the bladder be kept clean by drainage and irrigation. This procedure, while having the great advantage of avoiding catheterization, is open to the following objections: (a) With the flaccid condition of the abdominal wall in some of these cases it is difficult to keep the appliance water-tight; (b) Drainage of the bladder is almost certain to lead

to cystitis, and washing out of the bladder will be required; (c) Drainage of the bladder for any long period practically means the abandonment of any attempt to establish an automatic function, and in cases in which there is a possibility of recovery from paralysis, the bladder may be permanently damaged by the adoption of this course.

4. *Temporary paralysis of the sphincter.* During the trial of expression it was found that when the spasm of the sphincter was very obstinate, the passage of a large-sized instrument, which was allowed to remain in the urethra for a few minutes, was followed by marked facilitation of expression and the early onset of overflow. The idea of producing early paralysis of the sphincter vesicæ by instrumental dilatation then occurred. Vellacott believes that dilatation with suitable instruments might produce temporary incontinence, in which case repeated catheterization might be avoided and the stage of reflex activity reached without infection of the bladder. Very great care as regards surgical cleanliness would, of course, be necessary. The condition aimed at is analogous to that produced by stretching the sphincter of the rectum before the operation for hæmorrhoids, or to the temporary incontinence which follows the use of a large-size speculum in the female urethra.

REFERENCES.—¹*Arch. f. klin. Chir.* 1918, cxi, 71 (abstr. in *Med. Supp. Rev. Foreign Press*, 1919, April, 143); ²*Presse Méd.* 1919, July 10, 386; ³*Bull. et Mém. Soc. Méd. d. Hôp. de Paris*, 1918, series 3, xlii, 1051-7 (abstr. in *Med. Supp. Rev. Foreign Press*, 1919, March, 135); ⁴*Lancet*, 1918, ii, 839; ⁵*Brain*, 1917, xl, 188; ⁶*Lancet*, 1919, i, 733.

SPLEEN, FUNCTIONAL EFFICIENCY TESTS. *Oskar C. Gruner, M.D.*

Based on the fact that an injection of adrenalin causes a transient rapid lymphocytosis, W. Frey¹ made observations to discover the mechanism of this phenomenon, and concluded that it is dependent upon activity of the spleen. If the reaction fails to take place within half an hour, he concludes that there is fibrosis or similar pathological change in the organ.

REFERENCE.—¹*Zeits. f. d. ges. experim. Med.* Bd. iii, H. 6.

SPOROTRICHOSIS. *E. Graham Little, M.D., F.R.C.P.*

Vignolo-Lutati¹ reports two new cases. The first was a man, age 43, who had an indolent swelling of the left index which very narrowly escaped amputation by a surgeon who had diagnosed a tuberculous dactylitis. When seen by the author, the finger was twice its proper size, and there were several crateriform ulcers on its surface. Cultures of sporothrix were obtained on Sabouraud's glucose agar, and the case was completely cured within a month by the administration of 4-grm. doses of Iodide of Potassium daily. The second case occurred in a woman, age 53, on the dorsal surface of the right hand. The disease had begun as a diffuse swelling of the lower third of the arm, which had developed into an indolent tumour that had been operated on by a surgeon who had made the diagnosis of 'cold abscess'. Two fistulæ had been left by the operation from which ropy pus exuded. Lutati had the unusual luck to obtain mycelium in the films, and the characteristic culture developed on Sabouraud's medium, identifying the growth with *Sporotrichum beurmanni*. The patient was completely cured by the administration of potassium iodide in 5-grm. doses daily. Lutati distinguishes four varieties of sporotrichum: (1) White variety, pigmenting later, but pigmentation much delayed and never very pronounced; (2) Growth turns black, but slowly; (3) Growth turns black rapidly; (4) Growth black from the beginning. In sporotrichosis of deeper parts inaccessible for culture, a modified agglutination test has been devised which is of some service in diagnosis.

REFERENCE.—¹*Policlinico (Sez. Med.)*, 1919, April 1, 160.

SPRUE.

Sir Leonard Rogers, M.D., F.R.S.

ETIOLOGY.—B. K. Ashford,¹ working in Porto Rico, has recorded further important work in support of his view that sprue is due to a special variety of yeast fungus, named by him *Monilia psilosis* (see MEDICAL ANNUAL, 1917, p. 500). He has isolated the organism in culture in 61 out of 68 sprue cases, the negative ones being mild or cured ones. All but one gave a positive complement deviation with an antigen of *M. psilosis*, which was in proportion to the intensity of the clinical picture. He describes and illustrates cultures of the organism, the most important characters of which are that morphologically it is a clear-cut, bright, large globular yeast, with few granules, and a nucleus from 4 to 7 microns in diameter. The most characteristic cultural character is the production in a stab gelatin culture of lateral branches resembling an inverted pine-tree, while it only ferments glucose, levulose, maltose typically, saccharose often, and galactose occasionally. It therefore differs materially from the species of monilia found by Bahr and by Castellani to be associated with sprue in Ceylon. Ashford in his investigation "considered as sprue only such cases as should prove themselves positive, clinically, mycologically, and serologically". C. Michel² records details of the technique of the serological tests carried out with Ashford's *Monilia psilosis* mentioned above, and obtained 100 per cent positive results with it in sprue cases, but only 15 per cent with other monilia antigens.

L. Nicholls³ records further experience confirming the importance of oral streptococci and the curative value of vaccines made from them in sprue (see MEDICAL ANNUAL, 1919, p. 405). Cases which had resisted various other treatments for over a year cleared up rapidly under the vaccines, thus supporting the opinion that a streptococcus has an etiological rôle in the disease. He now suggests that some dietetic deficiency may play a minor part in predisposing to the infection.

Bassett-Smith⁴ records a case of sprue associated with tetany.

TREATMENT.—C. Michel⁵ records 81 cases of sprue showing the *Monilia psilosis* on culture treated with a Vaccine made from that organism, 62 of whom had completed the treatment, with 49 cases discharged cured, 12 improved, and 1 died. Great general improvement in health and steady gain in weight were the most striking results. J. B. Patterson⁶ writes on sprue in Corea, and records good results from the use of Arsenic in the form of Salvarsan or Sodium Cacodylate, combined with Emetine if mucus is present in the stools. Six grains of sodium cacodylate are given hypodermically every other day up to eight doses, and ten $\frac{1}{2}$ -gr. doses of emetine daily to ten doses.

REFERENCES.—¹Amer. Jour. Med. Sci. 1918, ii, 157; ²Ibid. 177; ³Jour. Trop. Med. and Hyg. 1919, Feb. 1, 21; ⁴Lancet, 1919, i, 178; ⁵Jour. Amer. Med. Assoc. 1918, i, 487; ⁶China Med. Jour. 1918, Nov., 514.

STOMACH, CANCER OF.

Robert Hutchison, M.D., F.R.C.P.

Gouget¹ draws attention to a rare form of cancer of the stomach in which the only signs for a long period are general dropsy with slight anæmia, gastric symptoms being entirely absent. Such cases are naturally very difficult of diagnosis, especially as the disease may show curious remissions, during which great apparent improvement may take place. The author does not attribute much importance to test meals as an aid in diagnosis, but considers that the x rays may help. He attaches most value, however, to the presence of occult blood in the stools. On the other hand, Koopman² is of opinion that the significance of occult blood in the stools is slight, and more often leads to error than otherwise. The value of test meals, too, is impugned by Kahn,³ who quotes the results of test-meal examinations by Graham and Guthrie in 150 cases

of gastric carcinoma, which showed that free HCl was present in nearly half the cases. On the whole, Deaver⁴ appears to be justified when he concludes that in spite of modern advances in diagnostic methods the opinion expressed by W. J. Mayo in 1904 still holds good. He said: "In an early exploratory incision we have the one diagnostic resource which is reliable, and which must be resorted to in a large majority of cases before a surgical diagnosis can be made. Without it the truth is but slowly established at the expense of progressively hopeless involvement. Exploration can be safely accomplished through a small incision and with a short time of disability. It is said that the patient will not submit to an abdominal incision upon suspicion. Herein we do the intelligence of the public an injustice; we have seldom been refused the opportunity, when the matter has been fairly and candidly laid before the patient and his friends. The plea for delay has more often come from the attending physician".

REFERENCES.—¹*Presse Méd.* 1919, June 19, 329; ²Ref. in *Jour. Amer. Med. Assoc.* 1919, i, 317; ³*N. Y. Med. Jour.* 1919, i, 105; ⁴*Ibid.* 749.

STOMACH, DISEASES OF.

The value of radiography in (pp. 15, 20).

STOMACH, FUNCTIONAL EFFICIENCY TESTS. Oskar C. Gruner, M.D.

Rehfuß¹ draws attention to the need of making more than one extraction of the gastric contents after a test meal, since the first sample may give a misleading result. "Gastric digestion is marked by a series of constantly changing phases", and the time occupied by any given phase may be comparatively short. There is no one curve which can be taken as a standard for health, nor is there any feature met with in disease which does not sometimes occur in health. This author's observations are based on 20,000 titrations during three years, and after experimentation with all kinds of foodstuffs; 45 per cent of normal cases show hyperacidity, and only 42 per cent of cases of ulcer show hyperacidity.

The changes which occur in disease include: (1) Delay in digestion; (2) Hurry in digestion; (3) Disturbance in secretory velocity resulting in hypo- or hypersecretion; (4) Alteration of digestion by the addition of frankly pathological products, such as blood, pus, or mucus. Such changes are the outcome of: (a) Soluble toxins in the blood; (b) Bacteria; (c) Blood dyscrasias; (d) Altered mucosa (e.g., *via* cirrhosis of liver); (e) Lesions in gall-bladder or appendix; (f) Pylorospasm; (g) Tryptic regurgitation from the duodenum.

Careful consideration will enable a distinction to be made between dyspepsia and anæmia, between chronic gastritis and pericholecystitis with duodenal adhesions (this causes vagotonia, but no occult blood). This differential method of analysis makes it possible to be sure that pus in the gastric contents is not merely swallowed purulent sputum, and, of course, the presence of gastric pus, of blood, or mucus betokens local disease.

Einhorn² carries out a similar system for the investigation of duodenal disease. The duodenal contents are abstracted in the fasting state, a cup of beef-broth administered, and samples withdrawn every half-hour for two hours. The tube is passed the night before, and it gradually enters the duodenum during the night. Although this process indirectly serves as a test of the functional capacity of the stomach, its prime object is to furnish information of the conditions obtaining in the duodenum, and therefore in the liver, gall-bladder, and pancreas.

Other methods of study which have been advocated are really only minor variations. Meunier,³ testing for gastric efficiency from one datum alone, is

able to avoid the use of a stomach tube altogether. The ordinary test meal is replaced by a small rubber bag containing an ether pearl. The bag is tied with a special kind of sheep-gut made from the second layer of the small intestine (purely muscle). In 50 to 60 minutes the gut digests, liberating the ether pearl. The subsequent eructations proclaim the time-factor.

B. B. Crohn⁴ uses oatmeal gruel for the test breakfast, and collects samples every fifteen minutes.

ACTUAL TESTS.—

Blood.—Thévenon and Rolland⁵ use pyramidon (5 per cent in 90 per cent alcohol) to add in equal volume to the fluid. Six drops of 1–3 glacial acetic acid are added, and then, after shaking, six drops of hydrogen peroxide. A violet colour betokens blood.

Lactic Acid.—Gérard and Regnault⁶ point out that some kinds of bread are able to give the test for lactic acid. To guard against such error it is better, in positive cases, to extract another portion of the gastric contents with ether. A positive reaction is now certainly due to lactic acid of gastric origin.

Lipase.—Carnot and Mauban⁷ make butter or lard into a paste with starch and agar; place this in a Petri dish; add the gastric contents; and incubate at 38° C. for an hour. The surface is then washed with copper-sulphate solution for ten minutes, and this is removed with water. Blue-green spots indicate lipase. The method can be made quantitative.

Trypsin.—The same workers⁸ employ egg-white tubes which have been made turbid by heat-coagulation. The test consists in noting how long it takes for the fluid to become clear.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, lxxi, 1534; ²*Amer. Jour. Med. Sci.* 1918, clvi, 817–30; ³*Arch. d. Mal. de l'Appareil Digestif*, 1918, ix, 683; ⁴*Amer. Jour. Med. Sci.* 1918, clvi, 801; clvi, 656; ⁵*Presse Méd.* 1918, xxvi, 425; ⁶*Comptes Rend. Soc. Biol.* 1918, lxxxi, 388; ⁷*Ibid.* 98; ⁸*Ibid.* 340.

STOMACH, SURGERY OF. *E. Wyllys Andrews, A.M., M.D., F.A.C.S.*

In the surgical treatment of gastric ulcer we are coming to depend more and more on simple gastro-enterostomy. Closure of the pylorus, taken up so enthusiastically recently, has led to as many bad results as gastro-enterostomy alone, if not to more. The various plastic operations upon the pylorus have been equally disappointing. Invagination of the ulcer has not produced the cures clinically that it has experimentally, and mass ligation has proved too dangerous. Simple excision, preferably with the cautery, should be done when the anatomical location of the ulcer permits. However, these procedures are all secondary to the making of a stoma.

Many disappointments occur after operations on the stomach, and these should only be attempted after prolonged medical treatment has failed. The causes of such disappointments are divided by Moynihan¹ into four classes:—(1) Gastro-enterostomies performed for other conditions besides ulcer. Visceroptosis, atony of the stomach, and many other conditions may simulate ulcer very closely. However, one ought never to do a gastro-enterostomy without first verifying the clinical diagnosis by finding the ulcer, because these cases are usually made worse by any operation on the stomach. (2) Other conditions—notably appendicitis and cholecystitis—frequently accompany ulcer, and probably bear a causal relation to it, and if they are not corrected at the operation we can expect no relief. (3) The surgeon may be at fault on account of some defect in technique. The loop of jejunum may be too long or too short, causing kinking or tension; the opening may be too small; it may be situated too high in the stomach, allowing a pouch to form below it. Jejunal ulcers may develop and give rise to a very unpleasant train of symptoms (Wright²): these are generally due to the use of non-absorbable suture material. Catgut

should always be used on the inner layer at least, if not in all layers. (4) We have the smaller group of unavoidable failures, due to jejunal ulcer and to malignant degeneration in an old ulcer. Hutchinson³ says that the stomach after gastro-enterostomy is usually atonic, and that the sudden emptying of such a stomach through a large stoma may cause much discomfort. Analyses of series of cases by Bottomley,⁴ Udaondo,⁵ Stretton,⁶ and others, show us that, although we may expect marked relief after a gastro-enterostomy, a complete cure cannot be promised, and a symptomatic cure with persistence of the ulcer is very common.

Mayo⁷ and Hartmann⁸ call our attention to the unexpectedly favourable end-results of radical operations for the cure of carcinoma of the stomach. Each used a modification of the Billroth No. II method, as illustrated in the accompanying diagram (Fig. 44). About one-fourth of the cases seen were still in the operable stage. Of those selected for radical operation, about one-third of the cases followed were free from recurrences at the end of three years. The immediate operative mortality was 13 per cent.

(See also ELECTROTHERAPEUTICS, p. 14, etc.)

REFERENCES.—¹*Brit. Med. Jour.* 1919, ii, 33; ²*Brit. Jour. Surg.* 1919, Jan., 390; ³*Brit. Med. Jour.* 1919, i, 535; ⁴*Boston Med. and Surg. Jour.* 1918, Dec. 12, 419; ⁵*Rev. Assoc. Méd. Argent.* 1918, xxix, 5; ⁶*Brit. Med. Jour.* 1919, i, 5; ⁷*Ann. Surg.* 1918, Aug., 236; ⁸*Presse Méd.* 1919, May 8, 245.

STREPTOCOCCUS INFECTIONS.

J. D. Rolleston, M.D.

In an article on re-infection with *Str. hæmolyticus* in lobar pneumonia, measles, and scarlet fever, L. Clendining¹ states that, of 319 cases of primary lobar pneumonia, 44, or about 14 per cent, became re-infected with this organism. The complications in these cases were as follows: (1) Empyema, which was by far the commonest, and occurred early in the disease; (2) Delayed resolution, which was found in 6 cases, with 4 deaths; (3) Lung abscess, which occurred in 1 case; (4) Localized areas of persistent pulmonary infection, of which there were 4 cases, all mild and ending in recovery; the pathology, therefore, could not be determined, but the condition was more probably an interstitial pneumonia than a bronchiectasis. Of 716 cases of measles, over 35 per cent had complications due to *Str. hæmolyticus*, such as otitis media, tonsillitis, bronchopneumonia, articular rheumatism, suppurative arthritis, and meningitis with general sepsis. In 134 cases of scarlet fever, there were 7 cases of streptococcus re-infection. Three of these were pneumonias, with 1 death. One of the remaining cases was streptococcal pleurisy, and the rest otitis media. All were of a mild character.

The prophylactic method adopted by Clendining has been to segregate every case of pneumonia, measles, and scarlet fever for twenty-four hours, during which time the throat is cultivated, and to assign special wards to streptococcus

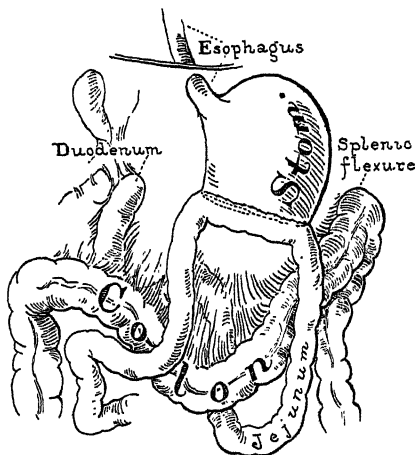


Fig. 44.—Diagram illustrating method of attaching jejunum and stomach. Omentum not shown.

and non-streptococcus cases of lobar pneumonia, measles, and scarlet fever. The incidence of bronchopneumonia in measles has in this way been considerably reduced, and streptococcus re-infection in lobar pneumonia has been entirely done away with.

A hospital epidemic of *streptococcus sore throat*, with surgical complications, is described by J. J. Keegan.² The epidemic originated in the nose and throat surgical wards, from which it spread by contact to the other wards. There was practically no possibility of spread by milk contamination. General constitutional disturbance was attended by secondary symptoms localized in the tonsils or lateral pharyngeal walls, with complications such as submaxillary and cervical adenitis, involvement of the nasal sinuses, middle ear, and mastoid, and metastatic infection of surgical wounds and joints. There was no bronchitis or bronchopneumonia. The epidemic was controlled by suspension of all operations, isolation of acute throat cases, and elimination from the surgical wards of all carriers of hæmolytic streptococci.

G. H. Weaver³ reports a case of acute streptococcus meningitis in a woman, aged 25, which was successfully treated by combined intraspinal and intramuscular injection of antistreptococcus serum.

REFERENCES.—¹*Amer. Jour. Med. Sci.* 1918, ii, 575; ²*Jour. Amer. Med. Assoc.* 1919, i, 1434; ³*Ibid.* 362.

SYPHILIS. (See also PUBLIC HEALTH ADMINISTRATION.)

Colonel L. W. Harrison, D.S.O., R.A.M.C.

DIAGNOSIS.—B. Dujardin¹ calls attention to the frequency with which syphilis is overlooked by failure to attend to small signs. In 1000 cases, of which 926 were men and 74 women, he found that 20 per cent of the men and 51 per cent of the women had no knowledge whatever of having suffered from syphilis. Certain slight but important signs gave him the clinical clue in a number of cases. Thus, in 95 there was irregularity of the pupils or failure to react to light. In 35 cases there was abnormality of the reflexes, tendon or cutaneous, especially (and often overlooked) inequality of the Achilles-jerk and inequality of the lower, or perhaps superior, abdominal reflex, produced by stroking sharply the upper internal surface of the thigh, as for the elicitation of the cremasteric reflex. In 24 cases the diagnosis was clinched by the discovery of leucoplakia, sometimes of the tongue or cheek, and sometimes of the palate. In the latter situation the enlarged mouths of the palatine glands were surrounded by circular patches of leucoplakia, 2 or 3 mm. in diameter, giving an appearance to the palate like that of a photograph of the moon with its craters in relief.

Klander² urges the importance of earliest possible diagnosis and treatment in syphilis. The older the primary lesion, the less likely the chance of finding spirochætes, and the more likely the Wassermann reaction to be positive. His article contains elaborate descriptions illustrated by photographs of many types of chancre. He lays great stress on a thorough knowledge of the clinical appearance of the primary chancre. Such is the importance of early diagnosis and treatment that he would, in the face of failure to find specific spirochætes, commence treatment on the strength of clinical appearances only.

Arthritis in Congenital Syphilis.—Castex and Denis³ draw attention to the necessity, in cases of rheumatism in children, of investigation from the point of view of syphilis. Cases of polyarticular syphilitic arthritis may resemble ordinary acute rheumatism very closely, and, if overlooked, may degenerate into chronic incurable conditions. The most common form simulates white swelling and hydrarthrosis affecting the knee or hip.

Dark-ground Demonstration of Sp. Pallida in General Paresis.—Shmookler and

Rubenstone⁴ claim recently to have discovered the method of demonstrating *Sp. pallida* in the brains of paralytics by emulsifying portions of the brain as shortly after death as possible, and examining under dark-ground illumination. The claim makes it necessary to refer to the article by Mott⁵ in vol. iv of D'Arcy Power and Keogh Murphy's *System of Syphilis*, 1919, in which the method is described as a routine procedure.

Changes in the Cerebrospinal Fluid.—Cornaz⁶ relates the results of his examination of the cerebrospinal fluid in different stages of syphilis. In 58 cases of primary syphilis with a negative blood reaction, there was an increase of lymphocytes in 8 per cent. In cases of roseola, lymphocytosis was present in 40 per cent, and the Wassermann reaction of the fluid was positive in 14 per cent. Cases of long-standing syphilis without signs showed a lymphocytosis in 40 per cent, and positive Wassermann reaction of the fluid in 7 to 8 per cent. Tertiary cases gave a lymphocytosis in 37 per cent, and positive Wassermann reaction of the fluid in 6.6 per cent.

Wassermann Test: Technique.—The desire for a standard Wassermann test is often expressed, and those who have devoted themselves to the task have turned naturally to the standardization of one ingredient which seems within control, and the quality of which has a profound influence on the results. This is the antigen. Browning and Kennaway⁷ point out that such a standard antigen would probably not fulfil all requirements, since some syphilitic sera react much more strongly with one than another, and vice versa. [This is a phenomenon to which frequent attention has been drawn, and it is the custom in many laboratories throughout the world to employ two or three varieties of antigen in the testing of such serum.—L. W. H.] The authors tested 360 sera with Browning and Mackenzie's liver-lecithin-cholesterol antigen and the heart-cholesterol antigen of McIntosh and Fildes respectively. They found that the results agreed in 83 per cent. In 4.2 per cent the heart extract was positive to the other's negative; in 5.8 per cent the lecithin-cholesterol gave stronger fixation to an important degree; and in the balance the differences were minor. They conclude that the use of one only of the known antigens would result in an important proportion of weakly-acting sera being classed as negative.

Ice-chest Fixation.—O. Berghausen⁸ reports on the comparative value of the Wassermann test with preliminary incubation at 37° C., and at 0° to 2° C, respectively. Three antigens were employed—alcoholic heart extract (1-10), the same with the addition of 0.4 per cent cholesterol (1-20), and Noguchi's acetone-insoluble fraction (1-10). In the case of the ice-chest fixation, the tubes containing the patient's serum, complement, and extract were left in the ice-chest overnight. The results showed that the method of ice-chest fixation gives a substantially higher percentage of positive reactions with syphilitic sera than does the usual method in which the ingredients are incubated together at 37° C. The author obtained no positives in 78 non-syphilitic sera, though he used a cholesterolized antigen. The latter has been accused by numerous workers of giving non-specific reactions when employed in the ice-chest fixation method.

Thomas⁹ advocates a modification of Noguchi's¹⁰ short-cut method of conducting the Wassermann test (see MEDICAL ANNUAL, 1919, p. 409), as follows. The anti-human hæmolytic amboceptor is titrated on the day of the test against 0.5 c.c. of 1 per cent cells, using 0.2 c.c. of pooled normal human serum as complement. The unit of amboceptor chosen is that amount which completes lysis in fifteen minutes. The antigen is the acetone-insoluble fraction prepared according to Noguchi's method. This is apt to become anticomplementary unless the greatest care is taken to prevent introduction of minute quantities of water or saline into the stock solution. Two or three stock antigens, one

extracted from human heart and the others from animal tissues, are pooled, as some sera will deviate complement with one extract and not with another. The dilution (to 1-10) is effected by addition of successive small amounts of saline, followed by vigorous shaking after the addition of each quantum. The tested serum should not be more than twenty-four hours old. If older than forty-eight hours, it is heated at 55° C. for half an hour, and the complement supplied by the addition of 0.2 c.c. pooled fresh normal human serum. In the testing of spinal fluids, similarly, fresh human serum is added. The steps in the examination of fresh sera are as follows :—

First Step.—Front row (test row).

Patient's serum (fresh and hæmoglobin- and cell-free), 0.2 c.c.

Antigen (acetone-insoluble 1-10), 0.1 c.c.

Normal saline (0.9 per cent), 0.5 c.c.

Back row (control).—

Patient's serum, 0.2 c.c.

No antigen.

Normal saline (0.9 per cent) 0.6 c.c.

Second Step.—Shake. Put in ice-chest 4 to 16 hours, preferably the latter.

Third Step.—Add to each tube 0.5 c.c. of 1 per cent human-cell suspension and 0.2 c.c. of dilute hæmolytic amboceptor containing the dose determined upon. Shake.

Fourth Step.—Incubate at 37° C. for 15 minutes. Record all control tubes not completely hæmolyzed. Continue incubation for another 15 minutes. Make first reading of results. Put on ice for one hour and make final reading.

The positive results in 2518 sera, compared with those obtained by the original method using ice-chest fixation, were as follows :—

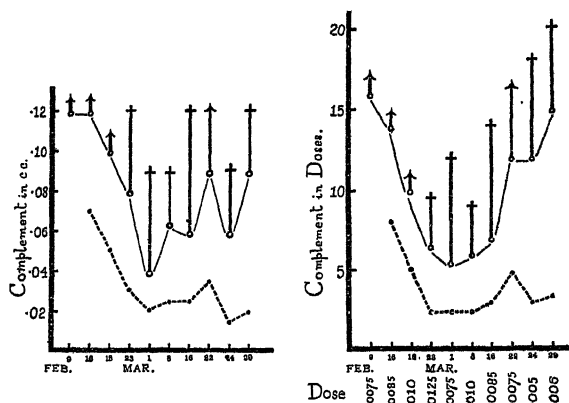
Author's homo-hæmolytic system	..	..	665 positive
Original method with	{	With acetone insoluble extract	.. 559 "
ice-chest fixation	{	With cholesterol-reinforced extract	.. 734 "

Thus, the greatest number of positives was obtained by the original method with ice-chest fixation and cholesterol-reinforced antigen. But the author rightly remarks that this is apt to give non-specific results.

[The reader will see that this method appeals on account of its apparent simplicity. The reviewer would not employ a method not conforming to the principles of the original test except as a supplementary test to the latter, which it helps to confirm. The employment of active serum has usually the advantage of greater delicacy, and is therefore valuable in estimating the effects of treatment, but is apt to result in non-specific positives. The disadvantage of an anti-human hæmolytic system is the impossibility of obtaining a high-titre amboceptor, and the fact that anti-human sera are so strongly agglutinating. —L. W. II.]

Wassermann Test : Paradoxical Reactions.—It is a well-known fact that the sera of certain patients, when tested from week to week, vary in their response to the Wassermann test in a most unaccountable manner. Such a serum will, for example, give successively a negative, a strongly positive, a doubtful, again a positive, and yet again a negative, though the patient has received no treatment during the period of the tests. Browning and Kennaway¹¹ attribute this partly to the variability of different samples of complement in hæmolytic activity and in deviability, and the absence of any fixed relationship in complement between hæmolytic power and deviability. Another factor is the difference between the amount of a given complement which causes only a trace of lysis and that which effects complete lysis under otherwise identical conditions. [Those workers who employ a method in which fixed serum and antigen react with varying amounts of complement, must frequently have been struck by the occurrence of such results as this : positive with three doses, and

doubtful with five, seven, and ten doses respectively; not, as they might have expected, doubtful with five, and completely negative with seven and ten doses.—L. W. H.] The authors tested certain specimens of human serum, syphilitic and normal, from week to week, the specimens being kept frozen at -15° to -22° C. in the meantime. The method of test was to estimate the amount of complement required to effect complete lysis. The results with two samples of serum, one powerfully syphilitic and the other normal, when tested from week to week against different samples of complement, are shown in the following :—



○ = First trace of lysis; + = Complete lysis; ↑ = Incomplete lysis with the highest amount of complement used, with the positive serum; = Complete lysis with the negative serum.

Amounts of Complement giving just Complete Lysis in the Antigen Control.—Feb. 9th, 2 doses; 16th, 7 doses; 18th, 2 doses; 23rd, 2 doses; March 1st, 2 doses; 8th, 2 doses; 16th, 2 doses; 22nd, 4 doses; 24th, 3 doses; 29th, 2.5 doses.

Fig. 45.—PARADOXICAL REACTION WITH WASSERMANN TEST.

The character of the variations in the results, now strong and now weak and yet again strong, shows that the variability was not due to progressive changes in the frozen serum, but to variations in the different samples of complement. The authors conclude that the criterion of a positive reaction must be, not the behaviour against an arbitrarily fixed number of doses of complement, but the comparison between the number of doses fixed by the serum and that fixed by a known normal. The authors do not suggest that this variability of complement is the only cause of paradoxical reactions, but one which has not received the attention it deserves. They conclude that minor variations in reactions from week to week have not the high prognostic import usually attributed to them. [Simply that a + + + + reaction, followed by a + + + in a few weeks' time, does not necessarily mean that the patient is half way towards recovery. Probably most laboratory workers will agree with this conclusion, although maintaining that, in routine practice, the samples of complement employed from week to week behave with very fair constancy.—L. W. H.]

Wassermann Test: Reliability.—The practitioner who realizes the limitations of clinical examination in the diagnosis of syphilis, and is ready to welcome any test which will give him a clearer insight into his patient's condition, must be disturbed when he reads the varying opinions on the reliability of the Wassermann test which appear from time to time in the medical press. On the one hand, he knows that reputable syphilologists the world over acknowledge their indebtedness to this test; on the other, he finds workers who assert that it

"tells us we have got syphilis when we haven't, and that we haven't it when we have". Few of the articles in question provide the data which would enable the practitioner to form his own judgement, and the informed reader must often register a wish that some such rules as the following were observed by writers on the subject:—

1. *The clinical evidence shall rest on examination by a thoroughly trained observer, backed, if possible, by an independent opinion of equal standing. It shall be revised whenever a positive W.R. disagrees with the clinical findings.* The reason for this will be apparent to anyone who has experienced the difficulty of excluding syphilis. How often subsequent events, other than blood tests, prove a case to be syphilitic when syphilis was at first excluded. And how often the observer has overlooked a single sign or a group of such which, correctly interpreted, would proclaim the diagnosis. In this connection the observations of J. Thomson and C. H. Mills on the Wassermann reaction in malaria are of interest. Here 8 out of 130 patients suffering from malaria gave a positive reaction, but careful clinical examination established a diagnosis of syphilis in every one of the eight cases.

2. *The serologist shall be one whose skill and experience is such as to render him as free as possible from the chance of technical errors. His method shall be described in full enough detail to allow of criticism by the independent reader. Every test which disagrees with the clinical findings shall have been repeated.* It is often said that a serologist's Wassermann results are quite unreliable until he has carried out at least 200 tests. The writer would vary this dictum by saying that, while the results of some serologists could be relied upon after they had done 20 tests, those of others would be worth nothing after they had done 2000.

3. *The chances of confusing the identity of sera in the laboratory should have been excluded, so far as this is humanly possible.* Those who have witnessed the various steps in the preparation of a batch of sera for the Wassermann test must realize how easy it is to confuse specimens. Careful precautions are taken against this, but so long as human beings are fallible, so long must the possibility of chance confusion remain. Such a chance emphasizes the advice always to retest a fresh specimen when the result does not agree with the clinical findings.

Judged by these standards, many of the articles which criticize the reliability of the Wassermann reaction fall very short of carrying conviction, and any attempt to summarize them would be mere waste of labour. On the lines suggested above, the Medical Research Committee completed their investigation into the Wassermann test by an inquiry into its reliability.¹² The first part of their report reviews the literature on the subject. Thus, Boas, in a series of 1927 control sera from either normal persons or patients suffering from one or other of nearly 100 different diseases, obtained only 5 positive reactions; 1 of these was a case of leprosy, 1 a case of scarlatina (out of 73 examined), and 3 of narcotized patients (out of 60 examined). Craig obtained 11 positives in 2643 presumably non-syphilitic persons; in 4 of these the diagnosis was malaria, in 3 tuberculosis was diagnosed, but two subsequently proved to be syphilitic, in 3 the diagnosis was pityriasis rosea, and in 1 no diagnosis was established. Buhman, in 286 cases of various diseases with no evidence of syphilis, obtained positive reactions in three cases of leprosy. Müller obtained 1 positive reaction in over 2000 presumably healthy persons; in a series of 5000 cases of diverse non-syphilitic diseases, mostly severe in character, he found positive reactions only in certain protozoal infections and leprosy. Considering the difficulty of excluding syphilis, these results, in the hands of experienced serologists, testify to the specificity of the Wassermann reaction when the test is properly conducted.

Amongst adverse criticisms of the test, one of the most serious is that by Uhle and Mackinney, who in 1915 submitted the sera of about 300 patients to seven serologists. The results varied very widely, and lend colour to the conclusion of the authors that the result of the Wassermann test is disappointing. For reasons we have given, the evidence does not appear to be very firmly substantiated. When the result of an examination of one person's serum on four different occasions results as follows—first examination 4 positive reports, 0 negative; twelve days later, 3 positive, 2 negative; next day, 5 positive, 1 negative; six weeks from first examination, 2 positive, 4 negative—one is tempted to suspect a paradoxically reacting serum in a latent syphilitic, even though the history and clinical examination are negative to syphilis.

Simons, Jones, and Goddard came to a totally different conclusion. They examined 981 sera and 19 cerebrospinal fluids in two different laboratories, one of which gave 218 and the other 223 positive reactions. When both laboratories employed the same antigen, their results agreed in 94.7 per cent of cases with the Vanderbilt University antigen, and 94.3 per cent with the Board of Health antigen.

Reports from other countries show that, although the vast volume of opinion strongly supports the great reliability of the Wassermann reaction, discordant opinions are not wanting.

In the hope of settling the question, the Medical Research Committee instituted an inquiry on the following lines. The sera of 104 persons suffering from a variety of ailments, syphilitic and otherwise, for the diagnosis of which Dr. Sequeira was chiefly responsible, were each divided into three, a portion being sent to (a) The London Hospital, (b) Rochester Row Military Hospital, and (c) The Bland-Sutton Institute of Pathology, Middlesex Hospital. The nature of the diseases was unknown to the serologists concerned. The technique employed at the London Hospital and at Rochester Row is very similar, especially in the matter of the antigen and its dilution, and the results obtained in both these laboratories agreed very closely. In six cases of treated syphilis they varied slightly, as follows:—

			Rochester Row.		London Hospital.
Case	8	..	+	..	+
"	18	..	+	..	+
"	10	..	-	..	(incomplete)
"	51	..	±	..	(trace of inhibition)
"	58	..	+	..	-
"	94	..	±	..	-

In one non-specific case of sclerodermia, Rochester Row reported a + and London Hospital a - with trace of inhibition. In another case Rochester Row recorded ± in a case of osteomyelitis. Sclerodermia has been reported by other observers as giving a positive reaction. It may be explained that + and ± are not considered as positive reactions by Rochester Row. The results obtained at the Bland-Sutton Institute did not agree so closely with the above, owing probably to an unexplained defect in technique on one particular day, when five divergent results were returned. In one case all four workers in the three laboratories reported a positive reaction in a case diagnosed as carbuncles and regarded as non-syphilitic. Unfortunately a second specimen could not be obtained. The Medical Research Committee conclude that, in competent hands, the Wassermann reaction may for all practical purposes be regarded as specific. They consider that much of the criticism and scepticism to which the test has been subjected amounts to mere statement, and that their searching inquiry into the literature of the last eight years "reveals really very little that can be classed as proved inaccuracy in the test".

Udo J. Wile and C. K. Hasley¹³ conclude that "as a diagnostic aid the positive Wassermann reaction still stands as our greatest aid", but that "as a guide to therapeutics the Wassermann reaction does not have a leg to stand on". The evidence on which this dictum is based is shortly as follows. Thirty-nine cases of syphilis, of which 18 were well-advanced secondary, 16 tertiary, and 10 latent, were treated and observed over a period of eighteen months, no patient receiving less than six injections of '606' and most receiving twelve, with intensive mercurial treatment. At the end of this time 21 were negative to the routine Wassermann test, but only 6 to the more delicate method of preliminary fixation in the ice-chest. Since to-morrow may bring forth a still more delicate method, the authors consider it a desperate and ill-advised thing to aim at a complete negative. The authors' method of reasoning appears to be that, since the reaction was still positive after they had administered what they considered adequate treatment, the test cannot be interpreted as indicating activity of spirochætes. The argument is difficult to follow, since eighteen months does not encompass the history of any case of syphilis, and nobody has yet defined adequate treatment. It might equally be argued that the ice-chest fixation method (if not too delicate in the sense of giving non-specific reactions) proved that even twelve doses of '606' are inadequate to the cure of an advanced case of syphilis.

Lambert, Olmstead, and Stuart¹⁴ have arrived at conclusions regarding the reliability of the test which are entirely opposed to the adverse views of Symmers¹⁵ and his colleagues, which were as follows: "(1) Depending on the antigen employed, the Wassermann reaction in the living patient, as carried out at Bellevue Hospital, gives a negative result in from 31 to 56 per cent of cases in which the characteristic anatomic signs are demonstrable at necropsy. (2) The Wassermann reaction in the living patient is positive in at least 30 per cent of cases in which it is not possible to demonstrate any of the anatomic lesions of syphilis at necropsy". Lambert, Olmstead, and Stuart compared the serological findings during life with the anatomical after death. Only those cases in which definite syphilitic lesions were discovered after death were placed in the group classed as 'anatomical syphilis'. Two antigens were employed, alcoholic and cholesterinized, preliminary fixation being at 37° C. with the latter, and in the ice-chest for four hours with the former. Out of 23 cases in which definitely syphilitic lesions, mostly late, were found after death, 18 gave a fully positive, and 2 (both treated cases) a doubtful reaction. Out of 188 anatomically negative cases, 175 gave a negative and 13 a doubtful reaction, most of the latter being afforded by the cholesterinized antigen. Out of 3 anatomically doubtful cases, 2 gave a positive and 1 a doubtful reaction; two of these had chronic interstitial orchitis, and the third had chronic hepatic cirrhosis. They suggest the possibility that Symmers' unreliable results were due to the use of cholesterinized antigen.

TREATMENT.—

New Arsenobenzol Compounds.—Kolle,¹⁶ who has succeeded Ehrlich in the directorate of the Georg-Speyer Haus, Frankfurt, has produced two new arsenobenzol compounds, 'Sulphoxylate—No. 1495' and 'Silbersalvarsan'. The first is a compound which, unlike neosalvarsan, is very stable; it can be sent out in ampoules already dissolved and ready for administration. In a 20 per cent solution it is isotonic. He considers it equal to neosalvarsan in effect, and of equally low toxicity, while it has the advantage of greater stability in contact with air. The relation of its therapeutic to its toxic dose in rabbit syphilis is 1:12, contrasting with 1:10 for neosalvarsan. [Sulphoxylate is definitely slower in effect than '914'.—L. W. H.] Sodium silbersalvarsan is a colloidal compound of silver and salvarsan of low toxicity and high therapeutic valency;

the relation of the latter to the former, as tested on rabbit syphilis, is 1:30, contrasting with 1:10 for salvarsan. Colloidal silver was shown by separate experiments to be more powerful than mercury in causing disappearance of *Sp. pallida* and healing of lesions in rabbit syphilis. [In physical characteristics silversalvarsan is very similar to Danysz's disodo-luargol or '102', which, it will be remembered, is a combination of salvarsan, silver, and antimony (MEDICAL ANNUAL, 1918, p. 534), and the accounts of its clinical effects recall very strongly those experienced in this country with disodo-luargol, particularly in regard to the smallness of the dose which causes disappearance of *Sp. pallida*, and the wonderfully rapid effect on ulcerative syphilitic lesions.—L. W. H.]

Weichbrodt¹⁷ reports clinically on 'sulphoxylate', or '1495', and on silver-salvarsan, in cases of general paresis. He found that '1495' was well tolerated in doses of 0.5 to 0.6 gm. (2.5 to 3 c.c. of the ready-made solution), and that, in courses amounting to 4 gm. or more, it caused disappearance of the pathological changes in the cerebrospinal fluid. Still better results were obtained with silversalvarsan, which was given in daily doses of 0.2 gm. for two weeks, followed by two weeks' interval, and then another course. In all four cases (one received 8 gm.) the treatment was followed by disappearance of pathological signs from the cerebrospinal fluid. The clinical effect on the paresis was not so marked.

Fabry¹⁸ reports on the effect of silversalvarsan. Doses of 0.2 to 0.3 gm. caused rapid disappearance of spirochaetes and of lesions. He recommends courses of ten to fourteen doses of 0.3 gm., or fifteen to twenty doses of 0.2 gm.

Dunn¹⁹ reports, *inter alia*, on Disodo-luargol. Danysz, independently of Ehrlich, proved the value of silver in protozoal infections, and conceived the idea of combining it with salvarsan. His first product was arsenobenzol bromo-argentic, or '88'. It was succeeded by the combination of '88' with antimony trichloride, or '102', which contains arsenic 20.7, antimony 8.2, and silver 7.4 per cent. Numerous workers have reported on the low toxicity and high therapeutic value of luargol. Danysz recommends frequent small doses rather than massive doses at longer intervals, on account of their superior therapeutic effect. [Further interest in luargol should be stimulated by the experiences above quoted with silversalvarsan, especially in regard to the influence of the latter on the cerebrospinal-fluid changes.—L. W. H.]

Results of Arsenobenzol Treatment.—Leonard,²⁰ comparing the results in 168 cases of syphilis treated by intramuscular injections of '914' with those in 260 similar cases treated by intravenous injections of the same amounts, found that the intramuscular method resulted in 6.5 per cent more negatives at the end of the course than the intravenous. The difference was more marked (9 to 10 per cent) in cases later than the primary.

Newcomer,²¹ judging results of treatment by the Wassermann reaction, found that, out of 26 patients, each of whom received twenty doses or more of '606', only 1 became permanently negative. The concomitant treatment by mercury was very irregular.

Richardson²² treated 12 syphilitic women each with about 1 gm. of '606' in two to three doses, commencing in all but one before the fourth month of pregnancy. All bore healthy children with negative Wassermann. The age of the infection was not stated, an important omission considering the small amount of treatment.

Mackenzie²³ reviews the result of eight years' experience with salvarsan and mercurial treatment. For the most part six injections of 0.3 gm. '606' were followed by mercury protiodide or grey powder for a year. Out of 63 early primary cases followed for a year, none relapsed. Out of 35 late primary, 8

subsequently gave a positive Wassermann reaction. Secondary cases proved more refractory, some remaining positive after more than twenty injections. Out of 658 cases followed up, 460 remained negative; of the remaining 198, only 35 subsequently became negative. He emphasizes the importance of commencing treatment in the early primary stage.

Harrison,²⁴ in an attempt to estimate the clinical results of arsenobenzol treatment, had instituted an analysis of 35,083 case cards in order to discover how many of them related to relapses after this treatment. [It was judged that this would afford a fair general idea, since most soldiers who had received anti-syphilitic treatment would, if not killed, be sent to Army V.D. hospitals if they relapsed.—L. W. H.] The scrutiny, three years after the commencement of the war, showed that 387, or 1.1 per cent of all the cases, were relapses after receiving 2.4 grm. or more of '606'. In another scrutiny, by Major C. F. White, amongst 18,500 cases, 730 were discovered to be relapses after arsenobenzol treatment. Analysis of 375 of these showed that only 13 had received seven injections or more. [It should be explained that well over 90 per cent of syphilitic patients in army hospitals received seven injections or more.—L. W. H.] It must be commented that such a method of investigation of the results as that described above, albeit the only possible one under the circumstances, could not afford more than an approximate idea as to the results. It justified the conclusion, however, that, on the whole, they had been wonderfully good, considering the circumstances.

Treatment of Ante-natal and Post-natal Syphilis.—J. Adams²⁵ describes the methods and results at the Thavies Inn Venereal Centre for Pregnant Women. In the case of pregnant women the treatment is by weekly intravenous injections of galyol or novarsenobillon, supplemented by intramuscular injections of grey oil 40 per cent (B.P.C.). Treatment is continued [presumably in courses with intervals.—L. W. H.] even up to the day of confinement. Out of 24 cases, 5 babies were born free from signs, with negative Wassermann; 7 became negative after treatment; 3 mothers had received no treatment up to the time of death of the fetus in utero; 1 baby died of syphilis; 1 was born dead; 1 died of a cause not ascertained; and 6 remained positive at the time of writing, but were doing well. The mother may remain positive though the child is born with a negative reaction. Treatment of the child may begin immediately after birth. The author gives intramuscular injections of galyol in glucose, commencing with doses of 0.02 grm., and increasing gradually to 0.05 grm. or more as the child grows older. Injections are given along the middle third of a line from the anterior superior iliac spine to the commencement of the gluteal fold. Mercury is also given by intramuscular injection in doses of $\frac{1}{2}$ gr. to $\frac{1}{4}$ gr. or more. The injections are given at intervals of a week or ten days. The author finds it easier to convert a positive Wassermann reaction to negative in a child than in its mother.

Toxic Effects following Arsenobenzol Injections.—Amongst the various toxic effects following arsenobenzol injections, that described as 'vasomotor', 'nitritoid', or 'anaphylactoid', has aroused the keenest discussion. The similarity of the symptoms—flushing, swelling of the face, lips, and tongue, and respiratory and cardiac distress—to those of anaphylactic shock gave rise originally to the idea that they were essentially of the nature of anaphylaxis. This idea has not received universal acceptance, numbers of workers having produced opposing evidence, and the true causation of vasomotor symptoms remains in doubt. It is clear that anaphylaxis and the vasomotor reaction following arsenobenzol injections have in common the capillary dilatation and endothelial damage, with succeeding symptoms, but whether the processes preceding these phenomena are identical is still undecided.

Stokes²⁶ produces evidence favouring the anaphylactic theory. He points out that Swift, in 1912, sensitized guinea-pigs by an injection of '606' and guinea-pig's serum, and these subsequently showed anaphylaxis on injection of a small dose of the same mixture. This did not explain vasomotor reaction following first injections; but subsequently it was shown by numerous workers that anaphylactic symptoms depend on changes in the dispersion of the colloids of the blood serum—in effect, that precipitates in the blood-stream cause anaphylaxis. Friedberger and Tsuneoka²⁷ showed that intravenous injection of such a powder as kaolin produced anaphylaxis. MacKee²⁸ found that acid solutions of '606' were precipitated in the blood-stream, and produced symptoms proportional to the concentration and rate of injection—that is, the rate of formation of the precipitate in the blood-stream. Danysz²⁹ has shown that '606' solution is colloidal, and is precipitated in the blood-stream, the rate of precipitation depending on the alkalinity of the solution. Berman finds that individual patients differ in the rate at which their blood precipitates '606' solutions, those who are prone to vasomotor symptoms following properly-prepared injections precipitating the solution more rapidly than normal. Stokes, therefore, believing that the vasomotor reaction is essentially anaphylactic in nature, and relying on the well-known anti-anaphylactic effect of Atropine, has recommended the use of this drug as a preventive of vasomotor reaction in sensitive patients. Atropine has the advantage over the commonly employed Adrenalin that it is not so violent in its effect. He reports the case of a clearly sensitive subject, in which a subcutaneous injection of $\frac{1}{30}$ gr. of atropine, fifteen minutes before an injection of '914', averted the vasomotor symptoms. In subsequent injections $\frac{1}{30}$ gr. failed, and $\frac{1}{7.5}$ gr. was only partially successful in averting vasomotor symptoms. The case was a particularly suitable one for proving the author's point, and, though isolated, the experiment was worked out in a manner which will carry conviction.

[Readers with experience of arsenobenzol injections will be aware of much which supports Stokes' belief. It is well known that imperfectly soluble samples of '606', those which are insufficiently alkalized, those which are given in too concentrated a form or (what amounts to the same thing) are given too rapidly, are particularly apt to provoke vasomotor reactions. This can all be translated into rate at which '606' is precipitated in the blood-stream.

Respecting '914', the reviewer has particular experience (unpublished) which tends to the same conclusion that vasomotor crises depend on the rate of the dispersion of insoluble particles in the circulation. A sample of '914' which had passed the animal test was submitted for clinical trial as its solubility was not satisfactory. Administered in the ordinary manner of to-day—i.e., concentrated—it gave rise to severe vasomotor symptoms, which did not arise when the injection was given extremely slowly. As mentioned, the sample was very imperfectly soluble, though eventually 0.6 grm. went apparently into complete solution in 10 c.c. water. The animal test was conducted with dilute solutions. Subsequently a batch of '914' of another make was encountered which caused severe vasomotor symptoms. It was also imperfectly soluble. It was sent to the Medical Research Committee to test on animals with another batch of the same make which was easily soluble. The two batches agreed in passing the test when given in dilute form, but in concentrated form the imperfectly soluble batch killed the test animals acutely. The perfectly soluble samples passed all animal tests, and, when injected into patients, gave rise to no ill effects. The lesson is that solutions of '606' should always be alkalized very fully, and that, if a sample of '914' is not easily soluble, it should be rejected or given dilute. Similarly, filtering or fine straining of arsenobenzol solutions is a precaution against vasomotor reaction. Conversely, if a patient

is susceptible, besides receiving either atropine or adrenalin, he should be injected very slowly with a more dilute solution than is commonly employed of the remedy in question, whether this be '606' or '914'.—[L. W. H.]

Harrison,²⁴ reviewing army medical experience of arsenobenzol injections during the War, concludes that the incidence of dermatitis and jaundice is fairly closely parallel to the intensity of individual courses of treatment, a course containing 2.4 grm. of '606' in twenty-eight days being attended by a greater incidence of these complications than the same amount given in forty-two days. The incidence had diminished again as the same course was lengthened from forty-two to fifty, and finally to fifty-seven days. The latest course had been attended by quite a trifling proportion of dermatitis. Experience had demonstrated very clearly that, in the avoidance of dermatitis, it is dangerous to ignore signs of intolerance, particularly erythema. No difference between German, French, and British makes of arsenobenzol compounds had been discovered.

Petrén,³⁰ from observations on influenza patients treated by injections of neosalvarsan in doses of 0.6 grm., concludes that, when vomiting follows the injection, it results from an effect on the centre of vomiting, not on the stomach.

Hirano³¹ finds that arsenobenzol compounds produce a reduction of suprarenal secretion in the blood, and concludes that this is the cause of the anaphylactoid or vasodilator symptoms sometimes observed after injections of these remedies.

Jackson and Smith³² consider that toxic symptoms following arsenobenzol injections are not due to formation of precipitates in the blood-stream, suggested by many, but to alkalinity of the solution and a specific effect of the drug itself. They recommend a trial of **Tyramine** in doses of 60 mgm. (1 gr.) hypodermically instead of the adrenalin usually advocated.

Percussion of the Spleen as a Method of Treatment.—Abrams³³ believes that the spleen as an organ of defence has not received the attention it deserves. Too much attention is paid to artificial methods and too little to natural. A specific electronic reaction can be elicited in cases of syphilis, and this persists in spite of artificial treatment. The spleen and liver, notably the former, are depositories of the luetic virus, and may become 'dead-corners' inaccessible to drug treatment. If the spleen is made to contract, by percussing the second lumbar vertebra, the virus is extruded into the circulation. This manoeuvre may cause an exacerbation of symptoms, and is an important help in eliciting the luetin reaction. If the spleen is made to expand, by percussing the eleventh dorsal spine, it draws in fluids (containing antibodies) from every corner of the organism. Thus, by promoting alternate contraction and expansion of the spleen, stagnant pools of virus are stirred up, and that interchange between fresh body fluids and splenic contents is promoted which makes for the building up of the organism's resistance to the disease. The author suggests, therefore, that treatment be as follows. The eleventh dorsal and second lumbar spines are located, and the skin over them marked, e.g., by silver nitrate. A cork and a tack-hammer suffice for the percussion; the cork is held firmly over the spine, and light blows are executed, first over the second lumbar for three minutes, then over the eleventh dorsal for the same time. The percussion is continuous for thirty seconds, followed by thirty seconds' rest, and so on for three minutes at each spine. The author claims that, if this treatment is conscientiously pursued twice daily for two weeks, the patient's health is greatly improved and the 'electronic reaction of syphilis' can no longer be elicited. Incidentally he mentions, though he does not believe in the Wassermann test, that five cases where the Wassermann reaction had persisted in spite of intensive treatment became negative subsequent to the splenic treatment.

[Without offering any opinion as to the author's treatment, the reviewer is impressed with the importance, in syphilis, of the factor of accessibility of the virus to remedies. It is quite possible that, where we fail to cure syphilis, we do so because our remedies do not reach the virus. Thus a well-sclerosed chancre often recurs after intensive treatment, because the spirochaetes buried in it are protected from attack by the barrier of new-formed tissue around them. The idea of stagnant pools of virus in the spleen and elsewhere suggests a reason for the fact that in old cases of syphilis it is often most difficult, if not impossible, to convert the Wassermann reaction to negative.—L. W. H.]

Soft Chancre.—Luithlen³⁴ has obtained excellent results in intractable cases of venereal sore from the intravenous injection with **Gonococcal Vaccine**. The vaccine is made to a strength of 100 million per c.c., and the injections are repeated every second or third day, the dose being increased from 50 to 100 million to 200 or 300 million. Good results can also be obtained from intramuscular injection of doses of 300 to 800 million. He attributes the results to the same principles as underlie colloidal therapy—injections of serum, milk, and foreign proteins—generally.

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SYPHILIS OF AORTA. (See AORTA.)

SYPHILIS AND PREGNANCY. (See PREGNANCY.)

TABES. (See ATAXIA; HYSTERIA AND ORGANIC AFFECTIONS OF THE NERVOUS SYSTEM.)

TESTICLE, DISEASES OF.

J. W. Thomson Walker, M.B., F.R.C.S.

Caley¹ formulates the following conclusions in an article on *The Undescended Testis* :—

The atrophy usually found is not the result of the malformation, but is congenital. As a general rule, when the testis shows marked atrophy it has little or no functional value. Torsion of the cord is more frequently seen in the undescended testis. There is a greater tendency to malignant disease in the undescended than in the normal testis. Operation should be advocated in children who have reached 8 or 10 years, and is even more strongly advised in those over 14 or in adults. In none of the series has malignant disease developed in the testis after an operation has been performed. Abdominal ectopia, unless double, should not be treated, but double abdominal ectopia should be operated before puberty. In operating, Caley depends on extensive freeing of the testicle and, if necessary, cutting practically all the vessels except the spermatic artery. He never attempts to anchor the testis in the scrotum.

Conservatism in the management of trauma and diseases of the testis is the subject of an article by Lydston.² In operating on tubercle of the testicle where an epididymectomy cannot be done from the involvement of the testis, but where some healthy gland tissue still remains, the author advises that the apparently healthy portion should be resected, cutting as wide of the infected area as possible. Then, instead of plugging the gland tissue in the almost inevitably infected scrotal cavity, it is implanted in the rectus muscle beneath the superficial fascia in the suprapubic region. Even if very small, such auto-implantations, he states, present vitality and retain their function of internal secretion. Should the implant be infected, the resulting tuberculous or purulent area is quite easily accessible and amenable to surgical treatment. In many cases of traumatism of the testicle the same procedure might be adopted.

An article on *New Growths of the Testes* is contributed by O'Crowley and Harrison Martland.³ These growths are teratomata in the greater proportion of cases, and appear in two forms: (1) A complex teratoma containing tissue representing derivatives of all three embryonic layers; (2) An embryonal carcinoma with polyhedral or rounded cells arranged definitely or in alveoli cut often like a lymphoid stroma. The latter is the most common tumour of the testicle, and it may not be possible to find in it other evidence of teratomatous elements. The authors collected 13 cases of new growth of the testicle. Seven of these had died after developing metastases. The metastases show the structure of a carcinoma. Of the fatal cases, the youngest was 5½ years, and the oldest 52 years. The longest duration of the disease was two years and seven months, the shortest ten weeks. Six out of the 13 cases gave a definite history of trauma.

Hinman⁴ discusses the radical operation for malignant growths of the testis, and arrives at the following conclusions: (1) The radical operation is justified in suitable cases by the high mortality following simple castration, by the definite experimental and surgical demarcation of the primary lymph zone, and by the possibility of the complete removal of this zone; (2) The radical operation is neither technically difficult, dangerous, nor mutilating; (3) The five successful cases recorded by the author show that the mortality should be little, or not at all, greater than in simple castration; (4) The ultimate result of these cases cannot be known for years, but the discovery in four of the cases of metastatic-growth tissue in the lymph areas removed demonstrates the uselessness of simple castration.

Boyer⁵ records a fibroma of the testis in a man of 33 years. The new growth developed in the tunica albuginea, and completely surrounded the testicle. It developed very rapidly following an orchitis due to mumps.

James⁶ publishes some observations on the *surgical treatment of gonorrhœal epididymitis*. He found the incidence of gonorrhœal epididymitis was 15 per cent. The advantages of operative interference are the evacuation of pus, the relief of pain, and that the tendency to sterility on the affected side is minimized. The chief objections that have been raised to the operation are: (1) The danger of injuring the tubules of the epididymis; (2) That puncture of the epididymis is efficacious; (3) That epididymotomy is too radical a procedure. In the author's 115 cases of epididymotomy, 12 were bilateral, and on examination later 6 of these showed motile spermatozoa. The operative procedure is as follows: The testicle is exposed, and a small puncture made through the tunica vaginalis to evacuate the hydrocele. The epididymis is then palpated externally, and the point of greatest induration selected. An incision is made through the tunica vaginalis covering the epididymis in the long axis of that body, commencing from the most dependent portion of the

globus minor, upward to the extent of 1 to 1½ in. The tunica albuginea is then divided in the same manner, and dissected freely to relieve tension and pain. A blunt probe is carefully pushed in several places into the epididymis. If a pus pocket is found, a fine artery forceps is introduced and the opening enlarged. Small encapsulated abscesses are frequently seen, and require puncture with the point of a knife. The author prefers this route to puncture through the cavity of the tunica vaginalis, as, in the latter, adhesions form after the operation which interfere with drainage. A plain fenestrated rubber tube is used for drainage. If there is a large pus pocket, the tube is laid in the long axis of the epididymis, and held in position by stitching the fibrous covering over it. Early operation is recommended to prevent pus formation. In a comparison of 50 cases treated by operation and 50 treated without operation, the following points appear: In the 50 operative cases, pus was found in 80 per cent; pain was relieved in from two to forty-eight hours; hydrocele was present in 90 per cent. In the 50 non-operative cases, pain was present in 98 per cent, and was relieved in from three to six days. In the non-operative cases there were 3 relapses, and in the operative cases there were none. The shorter the duration of the epididymitis before the operation, the shorter was the period of resolution.

An article on the treatment of *Genital Tuberculosis in the Male* is contributed by Quinby.⁷ In seven cases he treated the condition by the removal of the whole of either one or both seminal tracts. The operation usually performed consisted of a unilateral vesiculectomy, vasectomy, and epididymectomy. In no cases were those structures central to the epididymis found free from tuberculosis. On the other hand, one case had tubercle of the prostate while no abnormality could be found in the epididymis. In six cases the operation was followed by complete cure, no extension taking place at a later date. In one case the other side became affected and a second operation was necessary.

Torsion of the spermatic cord is discussed by Chute,⁸ and three cases are reported. The condition occurs in young men, the average age in 53 cases being 19 years. The chief predisposing cause is a developmental abnormality in the attachment of the cord to the epididymis and testis. An abnormally loose scrotum and a voluminous tunica vaginalis have also been considered to predispose to torsion of the cord. The exciting cause is unknown. The twist is always within the tunica vaginalis. The torsion is always acute; it may be partial or complete. There is sudden severe pain, vomiting, shock. The testicle is enlarged and tender, and the scrotum becomes red and swollen. The spermatic cord is not enlarged or tender except at the point of torsion. Diagnosis is made from acute epididymo-orchitis by the absence of any previous urethral discharge. A strangulated indirect inguinal hernia may closely resemble torsion of an undescended testis. The absence of the testis from the scrotum of the affected side suggests torsion. Vomiting, although it may occur at the onset in torsion, does not persist, while constipation and distention are absent. The symptoms of torsion tend to improve, while those of strangulation grow steadily worse. Atrophy of the testicle is probable whatever treatment be adopted. In any case seen shortly after the onset of symptoms, detorsion should be tried. Since the usual direction of the twist is from within outward and forward, the reverse should first be attempted. Increasing pain demands that an attempt be made to turn the testis in the opposite direction. If detorsion cannot be done, an operation is necessary. In the case of a fully-descended testis, an incision is made in the tunica vaginalis and an attempt made to untwist the cord; if this fails, orchidectomy should be performed. If the detorsion is successful and the circulation returns, Dowden recommends

that the entire tunica vaginalis be removed, the visceral layer scarified, and the testicle sutured to the scrotum with one or two catgut sutures through the tunica albuginea. For torsion of an undescended testis, orchidectomy is the best treatment.

REFERENCES.—¹*Surg. Gyn. and Obst.* 1919, May, 452; ²*N. Y. Med. Jour.* 1919, May 10, 800; ³*Surg. Gyn. and Obst.* 1919, May, 486; ⁴*Ibid.* 495; ⁵*Ann. Surg.* 1919, Aug., 210; ⁶*Jour. Amer. Med. Assoc.* 1919, May 24, 1514; ⁷*Ibid.* 1919, Nov. 30, 1790; ⁸*Boston Med. and Surg. Jour.* 1919, Aug. 21, 231.

TETANUS.

J. Ramsay Hunt, M.D.

Sir David Bruce^{1, 2} presents an exhaustive analysis of the cases of tetanus treated in home military hospitals during the war. His studies show the great value of antitetanic serum as a prophylactic and curative agent in this disease. A number of interesting analytical tables are given; e.g., *Table 1* records the total number of cases and the mortality.

Table II gives the average length of incubation of cases of tetanus treated in home military hospitals from August, 1914, to April, 1918. *Table III* gives the number, in percentage of cases, with short, medium, and long incubation periods, which have occurred since the beginning of the war to April, 1918.

Of especial interest is the relative proportion of general and local types of the disease and the relationship of trismus to the mortality, given in *Table IV*.

The Tetanus Committee of the War Office advocated the use of four prophylactic injections at intervals of seven days. *Table V* represents the mortality rate for cases receiving from one to six injections.

TREATMENT.—*Preventive measures.* The first and most important measure is the thorough treatment of the wound at the primary operation. The diminished incidence of tetanus was no doubt due in part to the more thorough surgical treatment to which wounds were subjected in the later years of the war. Of scarcely less importance, however, is the early prophylactic injection or multiple injections of **Antitetanus Serum**. It is of the utmost importance that these injections be systematically administered in all cases of trench foot. An initial dose of 1500 units is recommended, and when multiple injections are given, the subsequent dose is 500 units at seven-day intervals.

Therapeutic measures. In acute general tetanus the best method of treatment lies in the earliest possible administration by the intrathecal route. The intravenous is also an excellent and rapid one, but the danger of anaphylactic shock makes its use rather precarious. In cases of local tetanus, intramuscular injections are sufficient. The Tetanus Committee still recommend that in the treatment of acute general tetanus large doses should be employed. As an example of a large dose, the Committee cited 24,000 units on the first and second day.

Cummins and Gibson³ have also analyzed the cases of tetanus occurring in the British armies in France in 1916 and 1917. Their general commentary is as follows: A steady fall in case mortality has undoubtedly taken place. Where, however, so many factors may have played a part, the greatest caution should be exercised in attempting to draw definite conclusions as to how this improvement has been brought about. It must be admitted that the employment of antitoxin has, up to the present, failed to produce such a striking improvement as to be at once apparent in statistical records. On the other hand, the dosage has been small.

The union of toxin and antitoxin may be assumed to take place on quantitative lines. Since we are still ignorant of the actual quantity of toxin requiring neutralization in the average case, we cannot accurately decide whether the dosage of antitoxin hitherto given has or has not been on an adequate scale.

TABLE I.

Analysis	No. of Cases	Recovered	Died	Mortality
				per cent
1914-15	231	98	133	58
1915-16	195	99	96	49
Aug.-Oct., 1916 ..	200	127	73	37
Oct.-Dec., 1916 ..	100	69	31	31
Dec., 1916, to Mar. 1917	100	81	19	19
March-June, 1917 ..	100	71	29	29
June-Sept., 1917 ..	100	85	15	15
Sept.-Dec., 1917 ..	100	84	16	16
Dec., 1917, to April, 1918	100	76	24	24
Total	1226	790	436	35.5

TABLE II.

TABLE III.

Analyses	No. of Cases	Average Incubation	To 10 days	11 to 22 days	More than 22 days
		days	per cent	per cent	per cent
1914-5	231	13	47	26	6
1915-16	195	31	16	49	36
Aug.-Oct., 1916	200	31	14	44	42
Oct.-Dec., 1916	100	45	13	27	61
Dec., 1916, to March, 1917 ..	100	67	10	21	69
March-June, 1917	100	44	20	34	46
June-Sept., 1917	100	56	15	24	61
Sept.-Dec., 1917	100	47	13	31	56
Dec., 1917, to April, 1918 ..	100	47	26	29	45

TABLE IV.

	Cases	Recovered	Died	Mortality
				per cent
(a) Trismus the earliest symptom—				
1. With complete closure of jaws developing within 24 hours after onset of symptoms	17	7	10	59
2. With complete closure of jaws developing after 24 hours	19	14	5	26
3. With incomplete closure of jaws ..	111	85	26	23
(b) Trismus occurring after other symptoms of tetanus have shown themselves	57	46	11	19
(c) General tetanus without trismus	19	16	3	16
(d) Local tetanus	77	77	0	0

TABLE V.

No. of Inoculations	No. of Cases	Recovered	Died	Mortality
				per cent
Received 1 ..	125	94	31	20
„ 2 ..	127	103	24	19
„ 3 ..	52	43	9	19
„ 4 ..	38	35	3	8
„ 5 ..	14	13	1	7
„ 6 ..	2	2	0	0

On theoretical grounds we are inclined to the opinion that the dosage has not been large enough. It is possible that more striking results would have been obtained had larger doses been resorted to.

A point of more importance than any deduction from documentary records is the fact that the use of tetanus antitoxin is gaining ground amongst those charged with the care of cases. This would appear to indicate that clinical experience is leading to a favourable verdict, although statistical analyses are still inconclusive. It is clear, at least, that no ill-results follow this tendency to increase the dosage, as the mortality has fallen synchronously with it. When serum therapy is employed, the authors are strongly of the opinion that the antitoxin should be given at the earliest possible moment and in large doses.

REFERENCES.—¹*Lancet*, 1919, i, 331; ²*War Medicine*, 1918, 724; ³*Lancet*, 1919, i, 325.

TETANY.

Frederick Langmead, M.D., F.R.C.P.

ETIOLOGY AND TREATMENT.—J. Howland and W. McKim Marriott¹ have approached the problem of the causation of tetany from the standpoint of the calcium content of the blood-serum. They have been able to show that the normal calcium content of serum is from 10 to 11 mgrms. per 100 c.c.

In rickets there is a moderate reduction of the calcium in some cases, but a number of apparently active cases which were studied showed a normal amount. In tetany, on the other hand, during active symptoms, the calcium of the serum is invariably reduced, and may fall as low as 3.5 mgrms. The average in 18 cases was 5.6 mgrms. In convulsive disorders other than tetany there is no reduction in the calcium of the serum. The cause of this calcium reduction has not been explained. It is not connected with the amount of inorganic phosphates or of magnesium, for neither of these is increased. Tetany results at times from the administration of large quantities of sodium bicarbonate, but there is no evidence that 'alkalosis' plays any part in infantile tetany. Cathodal hyperexcitability, one of the signs of tetany, has invariably been accompanied by a marked reduction in the calcium content of the blood; anodal hyperexcitability, in a majority of cases, by a slight reduction. These investigations show that tetany is more nearly related to the calcium content than it is to rickets, and take us one step further in the etiology, leaving the explanation of the calcium reduction, however, still to find. These workers do not agree with the view that it is a result of parathyroid disability, for, as they point out, parathyroid lesions are the exception. Moreover, just as severe lesions as those which have been described in tetany may be found in the parathyroid glands of patients who have shown absolutely no evidence of tetany during life.

Noel Paton and Findlay, from a study of tetany in animals and human beings, come to the conclusion that the tetany produced in animals by removal of their parathyroid glands is similar to that in infants, both in character and metabolism, and that both are due to some error in metabolism whereby an intoxication by guanidin and methylguanidin is set up. This work needs confirmation, for the cases studied in children were very few, and the controls were children beyond the tetany age. Indeed, the investigation in the cases of the children was incomplete.

The important practical issue which has resulted from Howland and Marriott's investigation is that calcium administration produces a prompt effect upon the course of tetany, causing the spasms to disappear within a few hours. They recommend from 0.5 grm. to 1.0 grm. of Calcium Chloride every four hours by the mouth, and that this dosage should be persisted in.

Together with the disappearance of the symptoms, the calcium content of the serum rises, but generally fails to attain the normal.

Tetany has been apparently provoked by the injection of sodium bicarbonate (*p.* 12).

REFERENCE.—¹*Quart. Jour. Med.* 1918, July, 289.

THREAD-WORMS, TREATMENT OF. *Robert Hutchison, M.D., F.R.C.P.*

Kjerrulf¹ has had most success with Basic Aluminium Acetate in 15-gr. doses three times a day, along with a purgative such as compound liquorice powder, administered for three or four days. To ward off re-infection, the anus is smeared with a salve containing one part of Thymol to two parts each of Camphor and Sulphate of Quinine in 30 parts of lard. (*See also* ANTHELMINTICS, *p.* 2.)

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, ii, 461.

THROAT, DISEASES OF.

New method of applying Nascent Iodine in (*p.* 9).

THYROID SURGERY. *Sir W. I. de Courcy Wheeler, F.R.C.S.I.*

A valid theory of thyroid function appears at last to be crystallizing from an amorphous mass of fact, and recent conceptions of the thyroid activities are worth noting. At present the gland, especially in its 'exophthalmic' condition, is a kind of 'no man's gland'; both physicians and surgeons contest its possession. Early cases often do well with either treatment. Applications of α rays and radium, which produce fibrosis and dense adhesions, should be tried in cases where no gross pathological changes have taken place in the gland; but if this fails, the surgeon's task is made harder should operation become necessary subsequently.

The thyroid gland plays an immensely important part in the defensive mechanism of the organism. Controlled by the sympathetic, the brain cannot voluntarily inhibit its activity. The excess or defect of thyroid activity in relation to katabolism are so in evidence in adult life that McCarrison has compared its rôle in the living organism to that of the draught on the fire. On the other hand, Gudenach's work reminds us of its influence on anabolism. He has shown that feeding tadpoles on thyroid may increase their rate of growth over four times. Prof. Keith believes that the endocrine (ductless) glands may help to determine racial characteristics, and has suggested that the mongoloid facies in human evolution is dependent on thyroid peculiarities, due perhaps, in the first instance, to some climatic or geological factor, and perpetuated by heredity.

Langdon Brown¹ has seen relapse in a case of myxoedema during lactation, perhaps owing to the drain of a diminished thyroiodin reserve in the milk, for, according to McCarrison, the infant's own thyroid does not attain full functional activity for several months after birth, and is aided by a maternal supply. Langdon Brown gives his imprimatur to McCarrison's three principal conclusions as to the genesis and course of thyroid enlargements apart from neoplasms: (1) They are all due to psychic, nutritional, or toxic factors, acting singly or, more commonly, in combination; (2) In all, the pathological process is essentially the same: a greater or less degree of hyperplasia followed by a greater or less degree of fibrosis and atrophy; (3) In all, there is an alteration in the quantity and quality of the thyroid secretion poured into the blood-stream.

With regard to the first conclusion, Langdon Brown was struck by the frequency of enlarged thyroids during the periods of air raids on London.

Beebe² noticed the same thing in America in recruits under training. (Crile has never seen a case of Graves' disease caused by joy, success, or hard physical labour, unless attended by fear or other psychic strain.)

S. Pern³ thinks that thyroid hypertrophy is a sign that the thyroid is enlarging to protect the organism against toxins. While this might be so, in view of the fact that all the blood in the body passes through the gland in one hour, it is possible that its hypertrophy is less altruistic and that it enlarges to protect itself against the immense wash of toxins to which a large blood-supply exposes it. Forni's work,⁴ showing the increased resistance to infection of the remaining and hypertrophied kidney after a nephrectomy, supports this view.

The rôle of the thyroid as a receiving and distributing organ for iodine has long been recognized, and where iodine metabolism appears to be at fault, iodine or thyroidine reduces a simple goitre. Pern (*loc. cit.*) describes another type of goitre produced by defective *calcium* metabolism, and which occurs in Victoria, Australia: here the iodine content of the gland is actually increased, but lime, according to Pern, is deficient in the soil; rain-water is drunk, and the children, who are the milkers in these districts, usually dislike milk. These goitres improve with Calcium medication.

As regards intestinal intoxication, McCarrison's experimental production of goitre in goats by giving water contaminated with fæces is worth attention. There is some evidence that goitres are associated with coli infection, and Lawes' treatment by *excision of the colon* has thus been to some extent indicated.

As regards technique, C. H. Mayo⁵ recommends that laryngoscopic examination should be made *before operation* to disclose the condition of the vocal cords, as paresis or paralysis of an abductor or adductor may be present with but little change in the voice. Unilateral tumours on the right side may produce paralysis of the *left* recurrent nerve in such cases; surgical injury to the right nerve during thyroidectomy may result in total loss of voice.

The best method of approach is through a low collar incision. The sternothyroid and sternohyoid muscles should be cut high and re-sutured if they interfere with the surgical exposure of the gland; greater experience seldom requires their division. The isthmus should be removed, and double resection is the operation of choice in simple goitre, while in the exophthalmic type, removal of the larger lobe, isthmus, and part of the remaining lobe is the most common procedure. Drainage is instituted for twenty-four hours in the majority of cases, although the substernal goitre, the cavity of which does not immediately become obliterated by intrathoracic pressure, should not be drained longer than a few hours, at most, so that it may retain a blood-clot for organization; otherwise drainage from such cavities is indefinite. Dunhill and others also lay great stress on the necessity for the removal of more than one lobe in the treatment of hyperthyroid cases.

S. H. Rouquette⁶ emphasizes the excellence of *Local Anæsthesia* in exophthalmic goitre: he combines it usefully with 'twilight sleep', using hyoscine gr. $\frac{1}{100}$ and morphine gr. $\frac{1}{4}$ injected an hour and a half before operation, and morphine $\frac{1}{4}$ gr. half an hour later. The patient's ears are plugged and the room is darkened at the first injection. Rouquette finds the anæsthesia effective whether his anæsthetic solution contains novocain or not, and provided it contains adrenalin, normal saline will serve. He thinks anæsthesia is produced principally by tissue-distention.

The skin is desensitized to the first needle prick by a pad wet with 1-20 carbolic. Injection is made superficial and lateral to the gland; the capsule is not penetrated. Though discomfort may be complained of, it is not remembered. The temperature is always raised for a few days at least. Dyspnœa,

cyanosis, and restlessness (unless due to imperfect drainage) may be met by intravenous injection of strophanthin gr. $\frac{1}{250}$, adrenalin (0.1 per cent) 1 min., water to 6 min. "the effect of which is instantaneous".

This writer removes some of the clips closing the incision two days after operation, and the rest on the following day if the wound does not gape.

V. Crinks advocates the use of fine skin sutures, which are left in position for twenty-four hours and are then replaced successively by strips of gauze soaked in collodion. A very excellent cosmetic result is claimed. Kocher adopted the same method.

Alamartine,⁷ of Lyons, finds traumatic lesions less insignificant than has been thought. Through-and-through bullet wounds may cause gradual internal hæmorrhage which, having no tendency to cease, continues into the mediastinal or carotid regions. Diagnosis of thyroid involvement is therefore important, as these injuries may appear trivial for twenty-four hours. Superficial and deep mattress sutures are recommended (*Fig. 46*), or if there is much gland destruction, atypical thyroidectomy. The damaged tissue is removed and bleeding controlled.

The Goetsch Reaction.—W. D. Gatch⁸ has found this reaction very useful for estimating the degree of hyperthyroidism. A subcutaneous injection of 8 min. of a 1-1000 solution of Adrenalin diluted with an equal quantity of sterile water is made into the arm. Blanching occurs at once at the site of puncture, and round it a red areola appears which encloses the white centre. Observations are made every fifteen minutes. In thirty minutes this white centre becomes bluish-grey, and in about two hours the areola gradually assumes this tint as it fades from the centre. This bluish-grey ring remains for three to four hours if the test is positive and a definite degree of hyperthyroidism exists. The actual duration of the areola is a measure of that degree (in control cases the coloured areola is transient). Fourteen days after operation, Gatch found the test negative where previously it had been strongly positive. A differential blood-count shows a definite lymphocytosis in hypertrophied cases, which disappears after successful operation.

Thyroid Cancer.—Balfour,⁹ in 6859 cases of goitre, not including the exophthalmic variety, found 103 cases of thyroid cancer. In no case was cancer found to have developed in a normal gland. There appeared always to be some form of chronic irritation, usually a cyst or adenoma. Seven cases of cancer followed treatment by injections or applications. No cancer occurred in any purely hyperplastic gland. Clinically, malignancy was definitely diagnosed in only 18 per cent of the 103 cases. It was considered as a possibility in 36, and was unrecognized in 46 per cent. Except in well-developed cases, diagnosis is, therefore, curiously uncertain. In well-developed cases where the gland is fixed and offers a board-like resistance to the finger, malignancy can

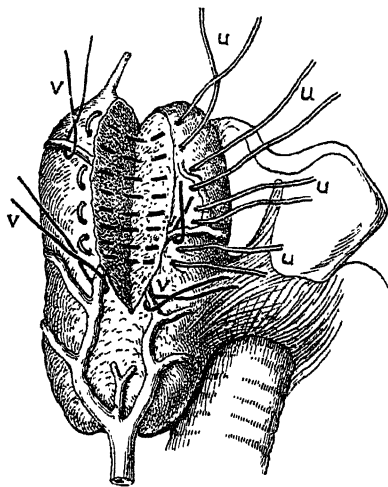


Fig. 46.—Thyroid hæmostasis (after Bérard).
V, capsular; U, deep cutgut sutures.

be diagnosed. The history and a negative Wassermann exclude the rarer conditions of acute thyroiditis, hæmorrhage, and syphilis. Adenomata with lime deposits may simulate cancer. "In no other region of the body is malignancy so well concealed", for both benign and malignant nodules tend to remain covered by healthy thyroid tissue. Thyroid adenomata, like those in the breast, are to be regarded as pre-cancerous, and should be removed without delay. In this author's experience, a thyroid cancer which has perforated the capsule and infiltrated muscles and glands has never been cured by surgery. **X Rays** or **Radium** should be tried. He quotes one case, however, apparently cured seven years after operation. In this case the lateral wall of the trachea and œsophagus were excised with the thyroid. A cautious daring thus would seem indicated in all well-developed cases. He confirms Mayo's observation that the trachea in malignant goitre is more apt to be flattened anteroposteriorly than from side-to-side.

Obstruction of the air-way may occur before, during, or after operation, and may be due (in addition to tracheal softening) to: (1) Operative injury to the nerve-supply of the laryngeal muscles; (2) Secondary œdema of the tracheal mucosa; (3) Secondary hæmatomata. This tracheal obstruction is not secondary to cancerous conditions only, but may follow a close dissection of a large surface of trachea in a benign case.

If *total* thyroidectomy is necessary, the active principle of the gland must of course be given.

J. Geiger¹⁰ recommends **Conduction-anæsthesia** for thyroidectomy. The anterior and posterior tubercles of the transverse processes of the 3rd and 4th cervical vertebræ can be palpated; those of the 4th lie too deep to the sternomastoid at the level of the upper border of the thyroid cartilage. The anterior primary divisions of the 3rd and 4th cervical nerves emerge between these tubercles. The 4th transverse process is located by the finger deep to the sternomastoid, and a fine and rather blunt needle is pushed through the muscle to touch the transverse process; 5 c.c. of a 1 per cent solution of novocain (with adrenalin) are injected. The needle is now slightly withdrawn, and directed upwards to touch the anterior tubercle of the 3rd transverse process, which lies $1\frac{1}{2}$ cm. above that of the 4th vertebra. The procedure is repeated on the opposite side. Anæsthesia is complete, rapid, and lasts for from one to one and a half hours.

Dunhill,¹¹ writing of the technique of operation for exophthalmic goitre, finds that instead of Kocher's collar incision, which follows the grain of the skin and gives a perfect scar, a V-shaped incision is often erroneously made. After incision, the skin should be reflected upwards to the top of the thyroid cartilage, and downwards to the episternal notch. Like Mayo, he rarely divides the infrathyroid muscles. The superior thyroid artery is liable to retract and bleed if it is simply tied and divided between two forceps: if it is first crushed with a forceps at the point of ligation, the ligature will not slip. Dunhill believes that the removal of one lobe only is insufficient in thyrotoxic conditions. As a rule, however, only one lobe and the isthmus of the gland should be removed *at first*, leaving removal of half or two-thirds of the second lobe for a second operation three months later; a third operation is sometimes needed. The upper pole is the part of the gland that must be left behind (*Plate XXXIV*). He believes that a patient never develops myxœdema if he is left with a piece of thyroid as big as a chestnut. Retrotracheal extensions (*Plate XXXV*) are troublesome to resect: they should be looked for and removed; otherwise they will enlarge after operation, and cause relapse. The upper pole of the gland may extend as far as the base of the skull. In closing the wound after thyroidectomy, the deep fascia should be carefully

PLATE XXXIV.
OPERATION FOR EXOPHTHALMIC GOITRE
(T. P. DESHILL)

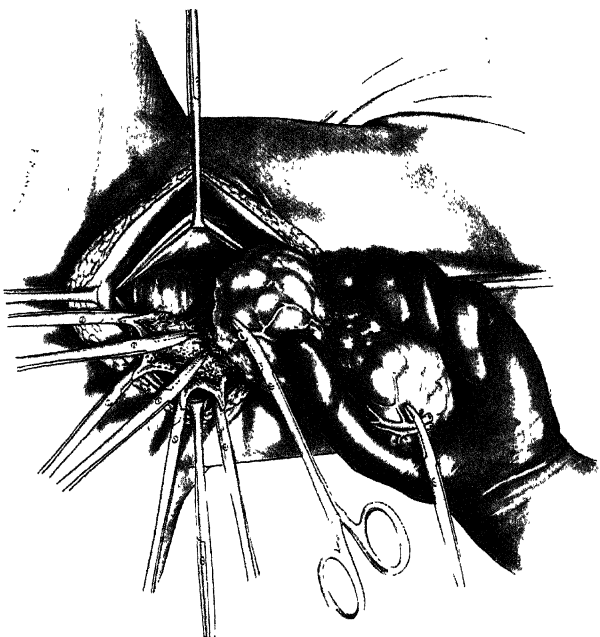


Fig. 1.—The left lobe is being divided above the four foreguts placed as guides. It is divided into two parts, the upper part is removed, the lower part is to take away the large lower lobe, leaving part of the posterior capsule and the upper pole intact and *in situ*.

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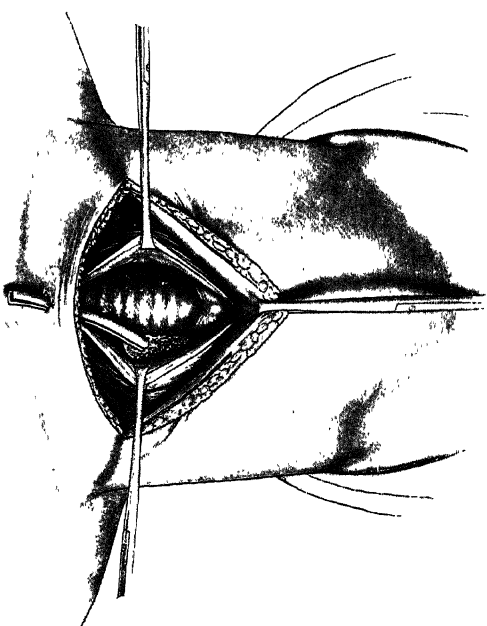


Fig. 2.—Shows the portion left and tube inserted.

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PLATE XXXV.

OPERATION FOR EXOPHTHALMIC GOITRE—*continued*



The protuberance from the posterior border sometimes present; sometimes extending behind trachea, sometimes pedunculated, and generally closely invested with areolar tissue.

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sufficed except at the point of drainage. Unless this is done, the skin tends to adhere to the trachea through the fascial gap, and leave an ugly pucker at the root of the neck.

Dunhill gives preference to **Local Anæsthesia** for thyroidectomy; it makes gentleness and dexterity imperative, and so helps to prevent an increase of thyro-intoxication. It is an advantage to give a hypodermic injection of omnopon and scopolamine, or morphia and atropine, half an hour before operation, and in most cases sufficient open ether to make the patient oblivious to the theatre surroundings. Infiltration of the line of incision with novocain and adrenalin is usually sufficient to render the entire operation quite painless. Each case, so far as anæsthesia is concerned, must be judged on its merits.

REFERENCES.—¹*Lancet*, 1919, i, 27; ²*Med. Rec.*, 1918, Feb. 9, 237; ³*Austr. Med. Jour.* 1918, April 6; ⁴*Archiv. Ital. Chir.* 1919, Part I, vol. i; ⁵*Med. Press and Circ.* 1919, Oct. 15, 307; ⁶*Lancet*, 1918, ii, 776; ⁷*Presse Méd.* 1919, Feb. 27; ⁸*Jour. Indiana State Med. Assoc.* 1918, Jan.; ⁹*Med. Rec.* 1918, Nov. 16; ¹⁰*Med. Woch.* 1918, Oct. 29, 1211; ¹¹*Brit. Jour. Surg.* 1919, Oct., 195.

TINEA IMBRICATA.

E. Graham Little, M.D., F.R.C.P.

It is a common statement in text-books that tinea imbricata does not occur in temperate climates and remote from the sea, and that it does not affect the face. Jouveau Dubreuilh¹ contradicts all these statements from personal experience. The disease is infective, but individuals may resist infection for long periods even when exposed to close contact. The best remedy is the application of 10 per cent **Chrysophanic Acid** in vaseline. The author advises caution in the application, only a small part of the body being tried at first, so that intoxication may be avoided. Special care must be used to the nail area, where the fungus often persists. It is well to keep the patient under close observation for two months, any new areas being immediately attacked with the ointment.

REFERENCE.—¹*China Med. Jour.* 1919, May, xxxiii, No. 3, 223.

TONSILS, DISEASES OF THE.

P. Watson-Williams, M.D.

A. J. Wright, M.B., F.R.C.S.

Irwin Moore¹ advocates the use of **London Paste** as introduced by Mackenzie for the reduction of enlarged or diseased tonsils in cases in which an operation is contra-indicated: A mixture of equal quantities of powdered caustic soda and unslaked lime is kept in a well-stoppered bottle, and when required for use the powder is mixed into a paste with a few drops of absolute alcohol, and applied to the tonsil on a specially designed applicator. Each application is for a few seconds only, repeated twice a week, the number of applications necessary varying from three to eight. The method is without risk, and little reaction is produced. He has also found **Galvanocautery Puncture** efficient, but without the same freedom from risk of sealing up sepsis by blocking the mouth of a crypt. Stewart² claims good results from **High-frequency Fulguration**, and cites the favourable opinion of McCaskey as to the use of **Ultra-violet Rays** in similar cases.

La Motte³ reports a case of *styloid process appearing in the throat*, in an adult female, with symptoms, the long styloid process presenting along the margin of the left anterior faucial pillar. The symptoms were recurrent attacks of tonsillitis and a constant aching in the side of the throat. A cure resulted from removal of the tonsils and of a portion of the process. Three similar cases from the literature are referred to.

REFERENCES.—¹*Jour. Laryngol.* 1919, Oct., 387; ²*N. Y. Med. Jour.* 1919, Jan. 4, 13; ³*Laryngoscope*, 1919, May, 288.

TRACHEA, DISEASES OF.

P. Watson-Williams, M.D.

A. J. Wright, M.B., F.R.C.S.

Stenosis of the Larynx and Trachea (see also LARYNX, STENOSIS OF).—Lynah¹ discusses the treatment of cases following diphtheria, which he groups under four types: (1) Neurotic; (2) Spasmodic; (3) Traumatic; (4) Pathologic, i.e., an organic stenosis either cicatricial or oedematous. Combinations of these types occur.

All cases can be cured, and the greater proportion by endolaryngeal methods and gradual dilatation. In the spasmodic cases, the use of a special intubation tube, with narrow neck and lumen cut out posteriorly, thus allowing movement of laryngeal muscles and arytenoids, is helpful. Cases without organic stenosis can often be successfully detubed by the direct method; the patient being unaware that the tube has been removed, the functional element, often so prominent, is obviated. Supra- and infraglottic oedema are best treated by the galvanocautery, webs also being best destroyed by this means. Supraglottic polypoid masses should be removed by snaring or with punch forceps, and the base cauterized. Lynah's 'non-cough-up' tubes with a bulbous tracheal swell will in every instance put a stop to persistent auto-extubation, while a properly-fitting tube tends to obviate the occurrence of decubitus ulcers. Cases with dense masses of fungating polypoid tissue in the cricoid region, or with complete laryngotracheal stenosis or extensive destruction of cartilage, can only be cured by laryngostomy; but the voice is better in those cases which can be cured by intubation than those in which a laryngostomy is necessary.

Uchermann² considers that needlessly extensive operations are frequently performed for laryngeal and tracheal stenosis. He has obtained successful results in five cases by slitting the stenosis anteriorly and medially with the blunt-ended herniotome introduced through the skin corresponding with the point stenosed, and then employing retrograde dilatation with a nickel cylinder which does not extend above the stenosis. Cannula and cylinder are removed each morning to allow coughing up of mucus. The essential of the method is slitting and dilatation of the exact point of stenosis, leaving the rest of the organ intact.

Fibroma of Trachea.—This type of tumour is regarded as second in frequency of innocent tumours of this region, papilloma being the most frequent. Horgan³ reports a case of removal of a fibroma from the anterior tracheal wall near the bifurcation. When first seen, the patient, a boy 9 years old, had urgent dyspnoea, with inspiratory stridor, extreme retraction, absent breath sounds over the lungs, and a vibratory sound over the upper sternal region. The growth, bilobed, pedunculated, and the size of a cherry, was removed with Luc's nasal forceps through a low tracheotomy wound. The site of origin was ascertained later by bronchoscopy.

Tracheocele.—Condray and Gurzev⁴ describe an example of this rare condition. The patient, a male, age 24 years, was blown up by a shell, but sustained no external wound. This was followed by a swelling in the neck, and dyspnoea. When seen eighteen months later he presented a slight gaseous swelling on the right side of the neck above the clavicle, and this increased in size on any effort. A gap could be felt in the tracheal rings on the right side. On tracheoscopy a soft swelling, the wall of the hernia, was found in the right side of the trachea, which swelling was bulged outwards on effort, being formed by the soft tissues of the neck. No operation was attempted.

REFERENCES.—¹*Laryngoscope*, 1919, Sept., 629; ²*Norsk Mag. f. Lægevidenskaben*, 1918, No. 79 (abstr. in *Jour. Amer. Med. Assoc.* 1918, Oct., 1354); ³*Brit. Med. Jour.* 1918, ii, 653; ⁴*Med. Press*, 1918, Nov. 6, 344.

TRENCH FEVER.

J. D. Rolleston, M.D.

ETIOLOGY.—In 2 out of 6 cases of trench fever, A. C. Coles¹ found spirochætes or spirochæte-like bodies in one or two of the many blood-films examined. They varied considerably in their form, but had in common the fact that they all stained with Giemsa a delicate blue tint, were all faintly granular, and in no cases were the ends pointed. The fact that they were only found in the blood of definite cases of artificially produced trench fever, and then only during the first attack of fever, is suggestive that they have a causal connection with trench fever.

SYMPTOMS.—Arneth² records his observations in the Italian theatre of war in February, 1918. Cases with a typical temperature chart were rare, the course of fever being more or less irregular. Pains in the bones were not always the most characteristic feature, and in three of the most marked cases, in which the apyrexial intervals were six days or more, they were entirely absent. As equivalents, headache alone, or accompanied by pain in the limbs, arthralgia, and neuralgia, was observed. Various sensory symptoms, such as hyperæsthesia, hyperalgesia, and neuralgia, were met with from the head downwards. Neuralgia of the abdominal wall, which was of special interest from its liability to be mistaken for appendicitis or gastric ulcer, was observed, as well as herpes zoster and intercostal neuralgia. A segmental arrangement of the painful areas was distinctly present and often unilateral, but might be bilateral at once, or appear first on one side and then on the other. Localized headache was sometimes the only symptom accompanying the febrile attacks, without any neuralgia or periosteal or osteal pains. Aggravation of old-standing enuresis, or cardiac neuroses, and especially severe neurasthenia, were common. Frequent attacks of diarrhoea, as well as sensory neuroses of the stomach, suggested involvement of the sympathetic. Palpable enlargement of the spleen was only occasionally found. All forms of renal complications were seen, such as transient albuminuria, severe functional disturbance in the excretion of water, with general dropsy and all varieties of war nephritis, or hæmaturia only. In the typical shin pains, often no changes were found in the bones; in rare cases there were localized swellings, and more frequently diffuse swellings along the crest of the tibia.

J. H. Lloyd³ describes a *subacute form of trench fever*, which is characterized by an irregular temperature of low degree, and splenic enlargement which can only be detected by percussion. Two groups of the disease are distinguished: (1) A painful group, the men being sent to hospital as cases of 'rheumatism', 'myalgia', or 'neuritis'; (2) A debility group, in which the diagnosis before admission was either D.A.H., V.D.H., or neurasthenia, debility, and N.Y.D.N. Such cases are very liable to be mistaken for malingering.

Gordon Ward⁴ records two cases of *chronic trench fever*, one of which presented an irregular temperature characterized by a small evening pyrexia with a much larger swing than normal below the normal line, and the typical hyperalgesic areas described by Carmalt-Jones⁵ (see MEDICAL ANNUAL, 1919, p. 440). The other case was an example of vasomotor symptoms, including hæmaturia, erythromelalgia, and oedema of the calves. R. D. Rudolf applies the term 'trench fever cachexia' to cases characterized by low general health, various pains, chronic slight fever, enlargement of the spleen, and hyperæsthesia of the kind described by Carmalt-Jones.

D. L. Tate and J. W. McLeod⁶ found that a palpable *enlargement of the spleen* was a feature of at least 10 to 15 per cent of the cases of trench fever which came under their observation. Examination of the blood showed that trench fever was accompanied by a moderate leucocytosis, and that during the pyrexial periods the polymorphonuclear leucocytes were relatively increased.

Gordon Ward⁷ draws attention to the following close *resemblances between malaria and trench fever*: (1) In both the onset usually seems abrupt, but indefinite prodromal symptoms are almost certain in each case; (2) The temperature chart of malaria very often shows a tendency to groups of rises of temperature like trench fever; (3) Comparison of the pains of malaria and trench fever shows that certain of them, especially those felt in the back and legs, are dependent on cutaneous hyperalgesia; (4) The effect of exercise in both diseases, such as allowing the patient to get out of bed, is usually to precipitate a recurrence of the pains and a rise of temperature and pulse-rate; (5) In both diseases the headache is usually frontal, less often temporal, and rarely occipital; in both diseases there is a great tendency to involvement of the part of the supra-orbital nerve within the orbit, giving rise to pain behind the eyes and in moving the eyes; (6) Vasomotor symptoms resembling Raynaud's disease or erythromelalgia, and local oedema of the shins, have been found in both diseases; (7) Both diseases are characterized by a long duration and attended with serious debility.

DIAGNOSIS.—J. B. McDougall⁸ considers that trench fever can be distinguished from malaria and influenza by repeated blood examinations. Lymphocytosis during the apyrexial periods, and polymorphonuclear leucocytosis during the pyrexial periods, is the condition found in the regularly relapsing type of trench fever. A normal differential count, in the absence of fever and subjective symptoms, may be regarded as proof of the absence of trench-fever infections.

The following distinctions, apart from laboratory aid, between trench fever and malaria, are given by Ward:⁷ (1) A rigor is usual in malaria if the patient is not taking quinine, but is unusual in trench fever; (2) Quinine controls the temperature in most cases of malaria, but has no effect in trench fever; (3) A rash is absent in malaria, but may be seen in trench fever; (4) Leg pains are more frequent in trench fever, but may be equally intense in malaria; (5) Some cases of malaria show a general pigmentation, often well seen on the lips, which increases with the attacks and diminishes between them; this is not seen in trench fever.

Rudolf⁵ states that if Carmalt-Jones's findings relative to hyperalgesia in trench fever (*see* MEDICAL ANNUAL, 1919, p. 440) are confirmed, they may be of great help in the diagnosis of chronic trench fever, sufferers from which are apt to be considered as malingerers, or at least exaggerators.

PROGNOSIS.—In a report from the Boulogne base by T. R. Elliott, D. S. Lewis, J. H. Thursfield, A. J. Jex-Blake, and Michael Foster⁹ on "Invalidism caused by P.U.O. and Trench Fever," it is stated that, out of a total of 822 cases, nearly 85 per cent recovered completely. The average time of invalidism for those who were returned to duty in France was about 60 days. Tachycardia was not regarded as of serious prognosis; for though it was observed in at least 30 per cent of trench-fever cases during early convalescence, it disappeared in two-thirds of the cases under the training of convalescent-depôt life. The general results of the Boulogne observations agree with the views held earlier in the war, namely, that cases of trench fever recover quickly and without any permanent ill effect.

TREATMENT.—Von Du Mont¹⁰ has obtained good results with a single large dose of Sodium Salicylate, $1\frac{1}{2}$ to 2 dr. being given on the morning of the day on which a rise of temperature is expected. Kaliebe,¹¹ on the other hand, gives small doses (7 gr. every two hours day and night) until the time when the next attack is expected. It is then given every three hours, and later every four hours. In every case so treated the expected attack failed to appear.

Blank and Felix¹² treated 15 cases by intravenous injections of 0.5 grm.

Neosalvarsan, and from the fact that no further attacks occurred after two injections, they concluded that neosalvarsan has a specific action in trench fever. On the other hand, the writers of the Boulogne report (*vide supra*) consider that no specific treatment for trench fever has yet been discovered. Removal of the patient from hospital environment, and restoration of his general resistance by food, fresh air, and light exercises till the infection is overcome, are all that is required. Few patients need prolonged treatment, and the majority can soon be returned to full duty.

REFERENCES.—¹*Lancet*, 1919, i, 375; ²*Med. Supp. Rev. Foreign Press*, 1919, 170; ³*Lancet*, 1919, i, 791; ⁴*Brit. Med. Jour.* 1919, i, 706; ⁵*Lancet*, 1918, ii, 809; ⁶*Quart. Jour. Med.* 1918-19, i; ⁷*Lancet*, 1919, i, 609; ⁸*Quart. Jour. Med.* 1919, 317; ⁹*Lancet*, 1919, i, 1060; ¹⁰*Med. Supp. Rev. Foreign Press*, 1918, 387; ¹¹*Ibid.* 1919, 80; ¹²*Ibid.* 171.

TROPICAL ULCER.

E. Graham Little, M.D., F.R.C.P.

Robert,¹ Director of the Pasteur Institute at Chulalongkorn, contributes an important paper on this subject. He would discard all other names in the description of the affection in favour of 'tropical ulcer', and he regards the causation as definitely settled in the sense that Vincent's fusiform bacillus and spirillum are responsible for the special characters of the ulceration. Two types of ulcer are distinguished, one of graver prognosis in which phagedænic ulceration is present, and the other in which the course is much slower and no constitutional symptoms are noted. In both types the characteristic diphtheroid membrane covers the wound, and the foetid smell is typical. The affection is widely distributed throughout the tropics and also in some temperate climes.

The treatment advised is fully described. A solution of **Neosalvarsan**, 3 per cent, freshly prepared, is soaked into a thin layer of cotton-wool and applied to the ulcer, being insinuated into all its fissures and recesses, and the procedure repeated a second or third time, when the fœtor and the phagedænic destruction should be eliminated. In default of this drug, **Vincent's Powder** (fresh hypochlorite of lime 1 part, finely powdered boric acid 9 parts) is freely dusted all over the ulcer, which should have a preliminary cleansing with permanganate of potash, and the whole be covered with a dry dressing. Films should from time to time be examined for the presence of the fusiform bacillus and spirillum, the disappearance of which marks the point at which these special applications may be discarded for dressings of ambrine, or gauze soaked in paraffin, or 1 per cent picric acid watery solutions.

Phagedænic Ulcer of Warm Climates.—This name is a synonym of tropical ulcer, and W. McMurray and F. O. Stokes² describe a small epidemic as confined to the Tarco district and the country drained by the Wallamba river. Nine cases are described in detail. In two a spirochæte was demonstrated which the authors identify with the *Spirochæta schaudinni* of Prowazek.

REFERENCES.—¹*Med. Jour. of Siam*, 1918, Dec., i, No. 3, 542-580; ²*Med. Jour. Australia*, 1919, Feb. 1, 87.

TUBERCULOSIS, LARYNGEAL.

P. Watson-Williams, M.D.

The employment of **Sunlight** as a therapeutic agent in laryngeal tuberculosis has been systematically tried at the Cragmore Sanatorium, Colorado, with apparently very promising results obtained by the use of the direct reflection of sunlight into the diseased area. Mills and Foster¹ describe an improved method used by them, as follows: The patient sits with his back to the sun. Sunlight is reflected from a concave metallic mirror into the patient's mouth, and upon a metallic laryngeal mirror held in proper position in the throat. A glass mirror is used to observe that the light is being properly directed. Both the metallic condensing mirror and the glass observation mirror are

attached by adjustable joints and supports to a frame which can be conveniently fastened to the back of an ordinary chair placed in front of the patient. After a little practice most patients readily learn to observe their own larynges and to direct the light upon the lesions. Beginning with very short exposures, usually thirty seconds daily, these are gradually increased to a maximum total of ten minutes, or, in a few cases, twenty minutes once or twice a day.

Operative Measures for the treatment of laryngeal tuberculosis find a strong advocate in Rüedi,² who records that in 575 cases he performed 1548 operations, mainly galvanocauterization, and in many cases curetting and cauterization combined, while in 61 only was curetting alone relied on. He tabulates his results in 387 cases where progress could be followed, thus:—

Laryngeal tuberculosis	Not improved, or little improved	Moderately improved	On the way to cure	Cured *
First stage ..	8	46	37	89
Second stage ..	42	89	13	48
Third stage ..	13	0	0	2
Total ..	63	135	50	139

* That is, three months to five years after operation.

He summarizes the cures obtained in the cases traced as follows: First stage, 180 cases, 89 cures (49·4 per cent); second stage, 192 cases, 48 cures (25 per cent); third stage, 15 cases, 2 cures (13·3 per cent). Rüedi formulates the following conclusions:—

1. Tuberculosis of the larynx is curable.
2. Spontaneous improvement as well as cure can be repeatedly observed in Davos under general treatment, but it must be denied that improvement in the pulmonary condition has a favourable effect on the laryngeal lesion. In several cases the fresh-air cure, as also the usual local conservative treatment, in particular heliotherapy, were insufficient or ineffectual, notwithstanding improvement in the pulmonary condition. A considerable proportion of these cases could be cured by operation.
3. Operative treatment of tuberculosis of the larynx should be undertaken only in cases where there is no fever and the pulmonary condition is stationary, exception being made for cases in which urgent symptoms demand interference.
4. The best method is electrocauterization (Mermod-Siebenmann's method), with its broad and deeply destructive radical effect. Only in cases of tuberculosis of the epiglottis did curetting prove itself better than resection or amputation.
5. Operative treatment resulted in cure in a little more than a third of the number of cases followed and checked. The best results (52 per cent of cures) were obtained by the electrocauterization of the cords.
6. Operative treatment exercised in several cases a very favourable influence on the lungs and on the general condition.
7. The contention that a stay at a high altitude is contra-indicated for tuberculosis of the larynx is wrong. Even in cases of pulmonary tuberculosis complicated by laryngeal tuberculosis a stay in the high mountains is indicated in accordance with modern experience of both. When the altitude has a

favourable influence on the pulmonary lesions, without being able to ameliorate the laryngeal, one must employ local treatment by electrocauterization according to Mermod-Siebenmann's method, which can bring about a particularly rapid cure under the favourable influence which the climate of the high mountains exerts on the vitality of the organism.

REFERENCES.—¹*Amer. Rev. of Tuberculosis*, 1919, Jan. (abstr. in *N. Y. Med. Jour.* 1919, Jan. 25, 149); ²*Brit. Med. Jour.* 1919, i, 764.

Arthur Latham, M.D., F.R.C.P.

Sulphur Dioxide Inhalations in Laryngeal and Pulmonary Tuberculosis.—F. Tweddell,¹ inspired by the observations of J. and R. J. Reynolds on the effects of dilute sulphuric acid in a variety of infections, has found the inhalation of Sulphur Dioxide extraordinarily beneficial in several cases of laryngeal tuberculosis. The best source of the gas is a small tank of liquid dioxide of sulphur, containing eight pounds and lasting about eight months. The amount of gas escaping can be gauged by bubbling it through a test-tube half full of water, the bubbles being at first allowed to come too fast to be counted. All the windows and doors of a small room are closed, and after the gas has been turned on for a few minutes, its escape is cut down to about 60 to 100 bubbles a minute. The patient stands not less than 6 feet from the tank, and inhales deeply two or three times a minute. Each course lasts fifteen minutes, and is repeated three to six times a day. If the patient coughs much, or suffers from lachrymation, it may be necessary to open the windows for a few minutes and begin again with less gas.

REFERENCE.—¹*Med. Rec.* 1918, Dec. 21, 1061.

TUBERCULOSIS OF THE SKIN. (*See ACNE SCROFULOSORUM; SKIN, TUBERCULOSIS OF; TUBERCULOUS DERMATOMYOSITIS.*)

TUBERCULOSIS, PULMONARY. (*See also PLEURISY; PUBLIC HEALTH ADMINISTRATION.*) Arthur Latham, M.D., F.R.C.P.

DIAGNOSIS.—Thomas McCrae and Elmer Funk,¹ in studying a series of cases of advanced pulmonary tuberculosis, have drawn attention to the fact that the recognition of chronic pulmonary tuberculosis is not so simple a matter as it is generally regarded. They state that:—

1. In a series of 1200 consecutive cases admitted as advanced pulmonary tuberculosis, 72 (6 per cent) were found to be incorrectly diagnosed.

2. Among 134 cases coming to necropsy, in 7 (5.2 per cent) the diagnosis with which the patients came to the hospital was incorrect, and in two of them it was not corrected.

3. The conditions most frequently diagnosed incorrectly were cardiac and cardiorenal disease (19 cases), chronic inflammatory conditions (9 cases), bronchiectasis (8 cases), pulmonary abscess (8 cases), and chronic bronchitis and emphysema (6 cases).

4. The diagnosis of advanced pulmonary tuberculosis should not be made unless tubercle bacilli are found in the sputum on at least two examinations.

5. Physicians in tuberculosis sanatoriums and hospitals should take particular care to verify the diagnosis in all patients sent with a diagnosis of advanced pulmonary tuberculosis.

Complement-fixation Test.—Henry F. Stoll and Lester Neumann,² in dealing with the complement-fixation test in the diagnosis of tuberculosis, conclude:—

1. It is at once apparent that the practical utility of the complement-fixation test in the diagnosis of tuberculosis is limited by the fact that the highest percentage of results obtains in the cases in which its need is least felt, namely, the obvious cases with tubercle bacilli in the sputum.

2. Nevertheless, it would seem that with suspicious symptoms, and suggestive yet inconclusive signs, a negative fixation test, using the method described by the authors, increases to a considerable degree the probability of the non-tuberculous nature of a given case.

3. With the same symptoms and signs, a persistently positive reaction probably signifies an active tuberculosis.

4. A positive reaction occurring with neither symptoms nor signs does not justify a diagnosis of active tuberculosis, though it is quite probable that there has been an active process recently.

5. With frank signs and symptoms, yet with no tubercle bacilli in the sputum, a negative test cannot outweigh the clinical evidence, though in all such cases a Wassermann test should be made.

6. The diagnosis of tuberculosis is many times one of great difficulty. A careful history, a thorough examination, repeated sputum examinations, and röntgenoscopic studies are all of recognized importance, and cannot be replaced by any complement test yet devised.

TREATMENT.—Waters,³ after a number of experiments, treated a series of patients suffering from pulmonary tuberculosis with a 2 per cent solution of **Para-toluene-sodium-sulphochloramine (Chloramine-T)** in teaspoonful doses every four hours, and gradually increased the amount until 0.6-grm. doses were being taken every four hours. As this dose caused a certain amount of gastric discomfort and vomiting, it was finally reduced to 0.3 grm. every four hours, which he found was well tolerated, especially if it were taken immediately after meals. He found that under this treatment there is first a slight fall in the number of tubercle bacilli and expectoration, and that this is followed by an enormous and rapid rise in the number of bacilli. In spite of this rise, which usually takes place on the tenth to the fifteenth day of treatment, the patients are stated to improve in condition. The number of bacilli remains high for three or four days to a week, and then there is a gradual fall, the condition of the patient steadily improving.

(See also **CHLORAMINE-T**, p. 6.)

Sir Leonard Rogers,⁴ in dealing with the treatment of tuberculosis by **Sodium Morrhuate**, is convinced that the drug is harmless in the doses recommended. He states that sodium morrhuate causes local congestive and febrile reactions, and insists on great care being taken not to push the drug beyond the limits which have so far proved safe. He usually begins with $\frac{1}{2}$ c.c. of the 3 per cent solution, and increases by 2 to 4 min. at each injection, which may be given two or three times a week until any reaction occurs; then a week's interval is left and the dose reduced. The injections are given subcutaneously until they reach an inconvenient size, such as 2 c.c., when intravenous injections can be begun with $\frac{1}{2}$ c.c., gradually increased in the same way as with the subcutaneous ones. Dr. Muir finds he gets the best results by pushing the dose until a febrile reaction occurs, and then returning to a small dose and gradually increasing it again. In febrile cases the doses should be smaller and more slowly increased than in afebrile ones. The author has given as much as 4 c.c. intravenously two or three times a week.

Perkins, Young, and Meeke,⁵ in an article on **Hetero-sero-therapy** in pulmonary tuberculosis, relate that when inoculating subcutaneously fluid from 'donor' chests with pleural effusion of a tuberculous type, in suitable cases of pulmonary tuberculosis, they began with a dose of 1 to 2 c.c., and increased it gradually to 15 or even 25 c.c. They were encouraged by the results obtained, and especially so in two of the eight cases treated in this manner. In these instances they state that "both cases were going steadily downhill; in both the use of pleural fluid was followed by marked improvement; in both the

cessation of injections was followed by a tendency to relapse; and in both renewed improvement followed their resumption."

Artificial Pneumothorax.—Vere Pearson⁶ has published a study of 21 cases of severe pulmonary tuberculosis in which he induced pneumothorax; 11 of the 21 patients are alive, and all save 2 of these are enjoying good health and following their usual avocations. Nearly all of the 10 who have died had their symptoms alleviated and their lives prolonged, in several instances by years, during which they enjoyed fairly good health and followed their occupations. The restoration of health and activity of most of the 11 surviving is wonderfully complete. The results are the more remarkable when it is recognized that they were obtained in patients whose state was generally of such a nature that only a few months of serious invalidism could have been anticipated under ordinary treatment. As a contrast to this, Pearson gives the after-history of those patients in whom artificial pneumothorax was attempted unsuccessfully. These cases numbered 7, and all save one of the patients died.

Vere Pearson holds that the principal factors affecting the course of treatment are: (1) In the early stages of treatment—that is, up to eighteen months—there is greater likelihood of making a mistake by injecting gas too seldom and taking the pressures too high rather than erring in the opposite directions; (2) Abandonment of the injections of gas in a successful case after too short a period is far worse than the continuance of refills for too long; (3) Every endeavour should be made to keep the pneumothorax cavity a closed one; (4) The cases which develop fluid at any time in the course of treatment want watching with special care.

Le Roy S. Peters,⁷ in a critical study of artificial pneumothorax in pulmonary tuberculosis, agrees with Murphy and his associates in holding that this method of treatment leads to: (1) The decline or disappearance of fever, showing a diminution or inhibition of absorption from the mixed as well as the tuberculous infection; (2) The diminution or disappearance of the expectoration; (3) The disappearance, partial or complete, of the bacilli in the sputum; (4) The gradual increase in weight; (5) The lessened frequency of hæmorrhage; (6) The great general improvement of the patient and the short time in which these changes take place. In his own work he has obtained the following results: Arrested, 31 per cent; improved, 13 per cent; stationary, 9 per cent; progressive, 3 per cent; dead, 44 per cent. He has compared these results with those obtained in institutions where artificial pneumothorax is not employed. The average result in the same type of case in East America is 4.5 per cent arrests, and in West America 15 per cent. He holds that by means of artificial pneumothorax the results obtained in unfavourable types of tuberculosis are seven times better than those obtained without this method in East America, and twice better than in West America.

The Treatment of Hæmoptysis.—S. Bang,⁸ in a systematic investigation of the conditions under which hæmoptysis occurred among sanatorium patients, found that no less than 69 per cent began to cough up blood when in the recumbent position, and only 6 per cent when walking or working. He found that practically every hæmoptysis which occurred during exercise was slight, and was never the precursor of a dangerous hæmorrhage, although many of the patients were in an advanced stage of the disease and were doing hard work digging and felling trees. Bang considers congestion and stasis in the lungs as being of considerable significance. Thus, among his cases of hæmoptysis there were 50 permanently febrile, 45 febrile shortly before hæmoptysis, 10 with a history of pain just before, 11 with 'colds', and 10 in which tuberculin had been given just before the hæmoptysis. Altogether in 159 out of 354 cases

there were inflammatory factors to which the hæmoptysis might be traced. In view of the fact that it has lately been shown that the blood-pressures in the aorta and pulmonary arteries are independent of each other, and that while the pressure in the aorta may vary within wide limits, the oscillations of pressure within the pulmonary arteries are very limited, he considers that the profession and general public are too wedded to the conventional idea of immobilization during hæmoptysis, and thinks that patients should be encouraged to sit up and move about, and that morphia should be withheld. Since he has adopted treatment on these lines, he has observed far fewer febrile reactions to hæmoptysis, and has never found a case of uncomplicated hæmoptysis followed by loss of weight.

P. Bergman,⁹ in dealing with the treatment of hæmoptysis, considers that hæmorrhage from the lungs may be checked (1) by modifying the circulation of blood through the lungs, and (2) by modifying the properties of coagulation of the blood. He holds that it is not necessary to enforce restriction of slight movement, as this cannot affect the pressure in the vessels of the lung. As coughing raises the pressure in the lungs, it should be checked, and for this, **Codeine**, not morphia, is indicated. Nitroglycerin and amyl nitrite have no effect on the pressure of the pulmonary arteries, and are therefore useless in hæmoptysis. For the same reason mustard plasters, diuretics, and aperients are useless. He sees no advantage in the use of an ice-bag, especially as the physician can seldom tell the situation of the bleeding point. Ice sucked and cold drinks may be useful, as they reduce the sensitiveness of the mucous membrane and thus diminish cough. Adrenalin is contra-indicated, as it induces great vasoconstriction in the systemic circulation, with the result that the lungs are flushed with blood. Ergot, he points out, is contra-indicated, as it increases the pressure in the pulmonary circulation more than in the systemic. Acetate of lead is useless. Digitalin increases the pressure in the pulmonary circulation, and is contra-indicated, but the **Infusion of Digitalis** or the **Tincture of Strophanthus** does not produce this effect, and may be given safely for hæmoptysis if the lungs are congested and circulation through the left heart is embarrassed.

In dealing with the effect of drugs on the coagulation of the blood, Bergman holds that calcium salts are of doubtful value, but he strongly recommends the use of **Sodium Chloride**, and states that after the administration of 5 grm. the rate of coagulation is much increased, and remains so for one to one-and-a-half hours. If the patient finds it difficult to swallow large doses of sodium chloride, the salt can be injected in hypertonic solution into a vein. The dose recommended is 3 to 5 c.c. of a 10 per cent solution. Pain at the site of injection may be relieved by hot compresses. It is said that sodium bromide has the same effect as sodium chloride.

W. R. Grove¹⁰ uses intramuscular injections of a 1-4 solution of the fused **Calcium Chloride** for hæmoptysis. In hard water there is a precipitate, but this is shaken up, and 4 min. of the cloudy fluid are drawn into a syringe, and boiled hot water is drawn up afterwards to the 20-min. mark. The solution is injected deeply into the gluteal muscles. It is stated that the injection is painless, and always acts 'like a charm'.

Fishberg advocates the employment of **Calcium Chloride** in controlling the abdominal pain and diarrhœa of tuberculosis (p. 5).

On the use of **Copper Sulphate**, see p. 6.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, July 19, 161; ²*Ibid.* April 12, 1043; ³*Med. Jour. of Australia*, 1918, Sept. 7, 200; ⁴*Brit. Med. Jour.* 1919, i, 147; ⁵*Lancet*, 1919, i, 556; ⁶*Ibid.* ii, 148; ⁷*N.Y. Med. Jour.* 1919, April 26, 715; ⁸*Hospitalstidende*, 1916, March 16 and 23; ⁹*Hygieia*, 1917, lxxix, 595; ¹⁰*Guy's Hosp. Gaz.* 1918, 155.

TUBERCULOSIS, SURGICAL.*Sir W. I. de Courcy Wheeler, F.R.C.S.I.*

A. K. Henry¹ considers that the waiting suture (the French *fil d'attente*) has a field of especial utility in treatment of *cold abscess*. Condemning drainage as barbarous, he finds open operation useful in securing more rapid results than are usual with aspiration, since, after aspiration, liquefaction of caseous débris may refill the cavity repeatedly. The abscess is incised. If the covering skin is thin and blue, it is resected; the cavity is cleansed with gauze, irrigated with Carrel-Dakin solution, and packed with gauze wick, smeared with the dilute non-toxic B.I.P.P. recommended by R. A. Stoney (bismuth and iodoform 2, vaseline 12, hard paraffin q.s. to give a consistence of butter). Whenever possible the wound is closed with bipped silk sutures. Of these, one (the waiting suture) is left loose to permit of withdrawal of the gauze wick after forty-eight hours: this is painlessly removed, for the B.I.P.P. acts as a lubricant. The waiting suture is then tied, and delayed primary suture is thus effected. The bipped gauze not only acts as an applicator, but is hæmostatic in cavities which ooze freely.

Hip.—Meyerding² finds, in his work at the Mayo clinic, that among the earliest symptoms of tuberculous hip is muscle spasm, the patient frequently pushing down the foot on the diseased side with the other foot, in an effort to effect extension and fixation. He calls attention to the value of von Pirquet's reaction in children under 5 years; its value decreases with age. Perthes' disease, osteochondritis deformans juvenilis, is to be considered in the diagnosis. (See JOINTS, SURGERY OF.) It shows characteristic epiphyseal changes. Infantile paralysis in its acute stages may simulate tuberculous coxitis, and is of course distinguished by the occurrence of subsequent paralysis.

It is important to know when tuberculous disease of a joint has ceased to be active. H. J. Gauvain³ describes a sign of pathological activity in tuberculous disease of the hip. He finds that the temperature chart is of no value because, under suitable conditions, the temperature of an uncomplicated case of hip disease speedily becomes normal, and should remain so, even when the disease is active. Pain likewise affords no clue, as with adequate treatment all pain is rapidly relieved and, indeed, is absent long before the disease becomes quiescent. The most constant and most marked evidence of active disease is spasm of the muscles about the affected joint. As the disease becomes less acute, spasm becomes increasingly difficult to demonstrate. It may be elicited in the following manner while any trace of active tuberculous disease remains:

If the femur on the affected side be grasped firmly in the region of the condyles, it will be found that the head of the bone may be gently rotated within the acetabulum, either inward or outward, through a varying but often considerable angle. When this movement is checked, if the disease remains active, a *further* slight but sharp rotation is instantly followed by spasmodic muscular contraction, not confined to muscles about the joint, but extending to the abdomen and visible in the abdominal muscles. This spasm is most easily appreciated by the palm of the hand placed on the abdomen between the iliac spines. This test should, of course, not be attempted where disease is obviously active, but in cases where doubt exists it is a sign of the utmost value.

Confirmatory evidence of activity, as indicated by muscular spasm, may at the same time be demonstrated as follows: In a child, a finger and thumb of the hand not engaged in grasping the femoral condyles is applied to the two anterior superior iliac spines. During the first rotation of the femur on the affected side, no movement is conveyed to the iliac spines. When, however, rotation has been checked and is sharply but gently continued, exaggerated movement in the same direction is transmitted to the iliac spines. With a

healthy joint this movement is not apparent; with a hip-joint affected with improving but still active tuberculous disease it is very striking, even when the disease otherwise appears to be quiescent. The value of the sign lies in the fact that without a definite indication of activity, ambulatory treatment may be too early permitted, with grave risk of relapse and further extension of the disease. On the other hand, recumbency may be needlessly prolonged, to the detriment of the patient's health and happiness.

Sacro-iliac Joint.—The writer (W. I. de C. W.)⁴ advocates the use of a peg-graft for securing bony fixation of a tuberculous sacro-iliac joint (*Plate XX XVI*). Access to the joint is easily obtained (see *MEDICAL ANNUAL*, 1917, p. 317). A graft about three inches long is driven through the ilium into the thick wing of the sacrum through the joint. In one case all pain had disappeared in six weeks, and the patient was apparently well twelve months after operation.

Spine.—R. Hibbs⁵ reports 210 cases treated by his operation. The earliest was operated seven years back, and the latest three and a half years ago; a fair estimate of the method is therefore possible.

The periosteum is reflected laterally from the affected portion of the vertebral column; the lateral articulations are curetted, each spinous process is fractured and bent so as to rest on the root of the spine below: chips are reflected down from each lamina to the next. All tissue other than osseous is removed from between the dorsal parts of the vertebræ, and the reflected periosteum is then sutured over bone which is in continuous contact. It is most important to control oozing throughout the operation with small gauze packs. The patient is kept in bed eight weeks, and wears a Taylor brace for about a year after operation. No attempt is made to select cases. The author operates on every case which can take a general anæsthetic. He claims 157 cures, 22 doubtful cures, and 31 deaths. The deaths include 5 cases of meningitis, 4 of pulmonary tubercle, 3 of amyloid disease, 2 of heart disease, 3 of miliary tuberculosis.

In the entire series of 210 cases, 35 showed cord-pressure symptoms, 26 being paralyzed, and 9 slightly spastic; 30 were completely cured of paralysis and Pott's disease; of the remaining five, 2 are still paralyzed and 3 are dead. Psoas abscess was present in 67 of the series, and in 11 cases was double: 42 were cured. Provided the abscess is not in the operative field, it does not contra-indicate operation. In 21 cases other joints were involved. Disease of the spinous processes and laminæ does not necessarily prevent their fusion.

In cases of angular deformity, the fracture and caudal displacement of the spinous processes practised by Hibbs reduces the angular projection. It should be noted that the average duration of the disease in Hibbs' series, previous to operation, was 4.4 years. This operation would be indicated where an Albee saw is not available, or where a graft could not be adapted to the angular deformity without first being cross-cut and cracked, and then moulded to the required angle.

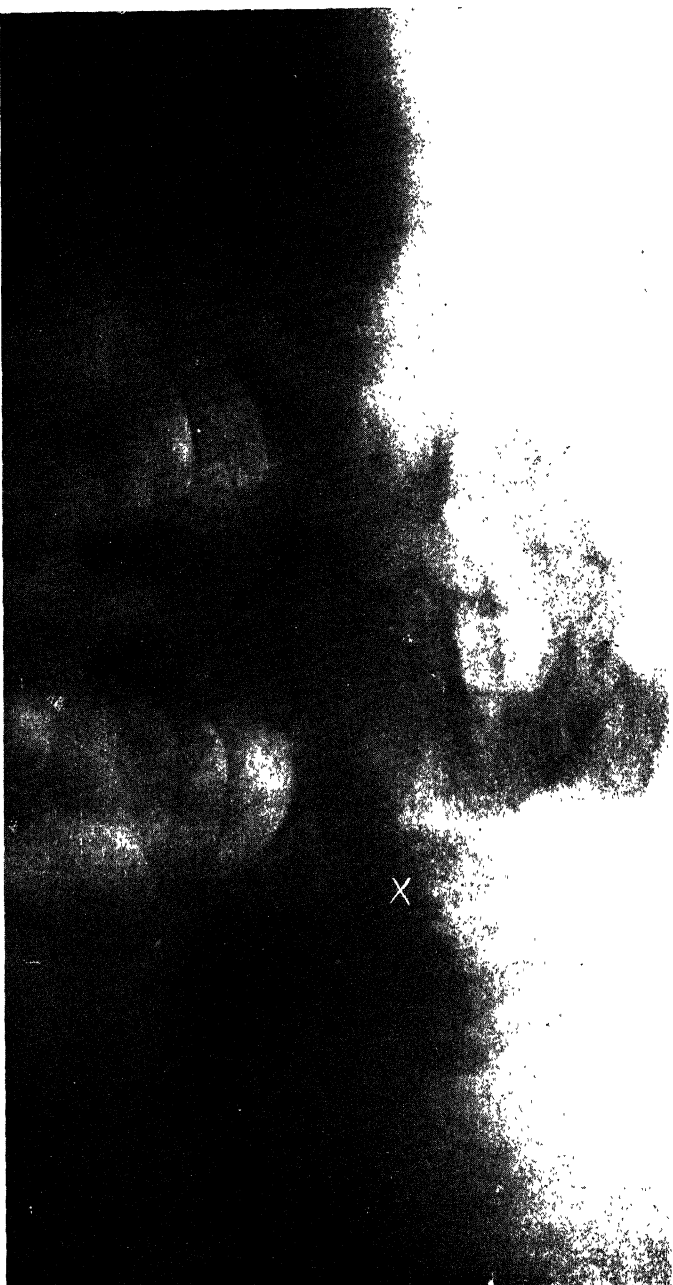
REFERENCES.—¹*Med. Press and Circ.* 1919, Nov. 12, 382; ²*Minnesota Med. Jour.* i, 291; ³*Lancet*, 1918, Nov. 16; ⁴*Dublin Jour. Med. Sci.* 1919, July, 21; ⁵*Jour. Amer. Med. Assoc.* 1918, Oct. 26, 1372.

TUBERCULOUS DERMATOMYOSITIS (BOECK'S TYPE).

E. Graham Little, M.D., F.R.C.P.

Mucha¹ describes very fully an interesting case of this rare condition in a woman, age 30. The symptoms began with a stiffness of the muscles of the buttock and thighs so that it was especially difficult to go upstairs. When seen by the author, the buttock muscles were weak and atrophied, while the muscles of the upper thigh were apparently hypertrophied, as were also to a

PLATE XXXVI.
TUBERCULOSIS OF SACRO-ILIAC JOINT



Fixation of the sacro-iliac joint by a tubal graft in old-standing tuberculosis of the joint. All pain disappeared after operation.
The X marks the position of the graft.

special degree the sartorius muscles on each side. The tensor fasciæ latæ showed a local thickening the size of an orange. The adductors were not hypertrophied. The lower thighs showed some hypertrophied muscles, perhaps exaggeratedly large because the fat was deficient. The foot muscles were normal; there was no retraction of the toes and no oedema. On the skin behind the left ear, on both upper arms, in the region of the hip and buttocks and upper thighs, there were numerous nodules and plateau-like flat masses of a deep- or brown-red colour, showing crusts and scales with much bleeding and scarring. There were infiltrated areas in the skin the size of a bean scattered over the sites of disease. Histological examination showed the epidermis intact, with thickened horn layer and papillæ flattened. In the infiltrated areas there was much connective-tissue proliferation without inflammatory cells. Typical giant cells were nowhere found. The hair follicles were absent, the blood-vessels thickened. There was an interstitial infiltration of the muscle in the affected sites; the muscle bundles were decomposed and stained palely. In other places were large fat-like vacuoles in the muscle which did not stain like fat. These changes went down to the level of the subcutaneous fat. The patient was given 0.1 mgrm. of Old Tuberculin, without local reaction being noted. Tuberculin injections were repeated to the number of eleven. She was able then to go home, and did not return, the report being that she had become worse and unable to travel.

REFERENCE.—¹Wien. klin. Woch. 1919, Jan., 25.

TYPHOID FEVER. (See also PARATYPHOID FEVER.) J. D. Rolleston, M.D.

ETIOLOGY.—The high carrier-rate in asylums is illustrated by Krumwiede and Somers,¹ who, owing to an outbreak of typhoid fever at the Brooklyn State Hospital, examined the fæces of the 516 female patients, with the result that 8 persons, or 15.5 per thousand, were found to be carriers. The advisability of inoculating all inmates of insane asylums against typhoid seems therefore unquestionable.

Champtaloup² reports the case of a man, age 72, who had been a carrier for thirty-seven years, during which time several of his fellow workers on different occasions had contracted the disease. Apart from his attack of typhoid fever in 1881, he had had no serious illnesses, and no history of gall-stones or gastrointestinal attacks could be obtained. Numerous typhoid bacilli were found in the fæces, but the urine remained persistently negative. The patient's serum agglutinated his own bacillus up to 1-300. He was kept under observation in hospital for four months, during which time many of the recognized methods of treatment were tried without avail. He was meanwhile trained in habits of cleanliness, and instructed to report to the Public Health Department from time to time.

BACTERIOLOGY.—Pulay,³ who has succeeded in cultivating typhoid bacilli from the sputum in 6 out of 33 cases of typhoid fever, is of opinion that in every suspected case of typhoid the sputum as well as the fæces and urine should be submitted to a daily bacteriological examination, as isolated negative results are of no value. These cases also show that typhoid bacilli are much more frequently found in the sputum in typhoid fever than is usually supposed, and that they are most likely to be found when severe bronchitis is present.

SYMPTOMS.—The occurrence of typhoid fever from two to twelve months after inoculation, an example of which was given in the MEDICAL ANNUAL, 1919, p. 451, is further illustrated by outbreaks reported by C. B. Hawn, J. D. Hopkins, and F. M. Meader⁴ among American troops in England, and by C. P. Brown, F. W. Palfrey, and L. Hart,⁵ at Camp Greene, N.C. Exposure to massive doses of the infecting agent seemed in each instance to have been the

cause of the failure of immunity. Of 38 cases reported by the first-named writers, 27 were much more severe than would have been expected in inoculated men, owing to the advanced stage of the disease on admission to hospital. The average duration of the fever was over 35 days, the shortest being 19 days and the longest 58 days. Five deaths occurred, a mortality of 13·15 per cent, death being due to toxæmia in three cases, to pneumonia in one case, and to surgical shock following operation for perforation in one case.

Etienne,⁶ who had previously recorded a mixed infection of *B. typhosus* and *B. paratyphosus* A in three inoculated persons, now describes a case of association of typhoid and paratyphoid B fever. The onset was not sudden as in the previous cases, but resembled that of typhoid. On the other hand, greenish vomiting, which is very rare at the onset of typhoid and is more frequent in paratyphoid, and profuse sweating, were noted on the fifth and thirteenth days of disease. The course of the illness was very severe, and successive febrile periods were noted, as in Etienne's previous cases, but ultimately recovery took place.

The subject of *pleuro-typhoid*, as typhoid ushered in by pleurisy is called, is discussed by Mondolfo.⁷ Authorities differ as to the frequency of pleurisy in typhoid fever, the estimates varying from 0·5 to 14 per cent. In the great majority of cases the pleurisy is on the left side, this localization being attributed to the neighbourhood of the spleen, the chief habitat of typhoid bacilli. Pleurisy usually occurs towards the end of typhoid fever, and pleuro-typhoid, properly so-called, is comparatively rare. Mondolfo's case was that of a soldier, age 38, who was admitted to hospital with signs of right pleural effusion. The constitutional disturbance, however, was more severe than is usually found in that condition, and delirium was a pronounced feature. Bacteriological examination of the blood, and Widal's reaction, were negative on the sixth day of disease, but were both positive on the twelfth day. In the second and third weeks, characteristic symptoms of typhoid fever developed. The disease lasted eight weeks in all, and ended in recovery. The case thus confirmed the general rule as to the prognosis in such cases, the outlook being all the more favourable the earlier the pleurisy develops. On the other hand, when the pleurisy appears at the height of the disease, and especially in convalescence, there is a greater tendency for the effusion to become purulent. Examination of the fluid in Mondolfo's case showed a pure culture of typhoid bacilli. More frequently, however, the typhoid bacilli in the pleural fluid are associated with staphylococci or pneumococci, or staphylococci and streptococci. Cytological examination in such cases is of value, as the presence of polymorphonuclear and endothelial cells in excess indicates that the pleurisy is of typhoid origin. Widal has found that the fluid possesses a definite agglutinating power, which is sometimes equal to, but more frequently below, that of the blood serum.

Tassone⁸ classifies the *osseous complications* of typhoid fever into four groups, according to the intensity of the process: (1) Rheumatoid pains, which may end in spontaneous resolution; (2) Acute osteoperiostitis, characterized by general symptoms and local changes; in slight cases the periosteum alone is affected, while in severe attacks the inflammation extends to the bone-marrow and causes a true osteomyelitis followed by necrosis; (3) A chronic suppurative form, with a late onset and slow course, like that of a cold abscess; (4) A chronic non-suppurative form, with a tendency to the formation of exostoses.

PROPHYLACTIC INOCULATION.—During the epidemic of enteric fever in Flanders in 1914–15, Goodall⁹ states that, in addition to the ordinary sanitary measures taken in epidemics of this kind, inoculation of the civil inhabitants of the infected areas with antityphoid vaccine was made obligatory by the

Belgian authorities, those who refused inoculation being liable to be expelled from the zone occupied by the allied armies, and treated as refugees. Goodall, however, attaches more importance to the effects produced by the usual sanitary methods than to the inoculations: these were against *B. typhosus* and not against *B. paratyphosus* A and B, which were responsible for a large number of the cases.

In the Seventh Annual Report¹⁰ on Typhoid in the Large Cities of the United States, attention is drawn to an unprecedented condition. Whereas during previous wars typhoid not only prevailed extensively in army camps, but spread thence to the civilian population, in 1918 no material increase in typhoid occurred generally in civilian communities. Antityphoid vaccination of the military forces of the United States not merely protected soldiers in camps, but probably prevented the spread of the disease throughout the civilian population.

In his thesis on typhoid and paratyphoid inoculation during the war, Zivy¹¹ points out that though large doses of the vaccine are well tolerated by healthy subjects, this is by no means the case in persons with some morbid taint. The reaction in such cases depends on the amount of vaccine injected, and it is therefore advisable at first to give a small dose. As ordinary doses of the vaccine rouse tuberculosis into fresh activity, Zivy gave small doses to cases in which this disease was suspected, and in the great majority of cases was able to continue the inoculations. In persons with a history of simple or mucocommembranous enteritis, the inoculation was followed by a recrudescence of the intestinal symptoms and a rise of temperature. In a case of chronic hepatitis, a febrile reaction and clay-coloured stools occurred. In two cases with a history of malaria, the temperature after vaccination rose to 102° and 104° respectively, but a further rise was prevented by administration of quinine before inoculation. Eight of Zivy's patients had had enteric from five to forty years previously. All of these had a rise of temperature which lasted from one to four days and was accompanied by severe constitutional disturbance. In all the cases vaccinated—63 in number—a considerable increase in the size of the spleen was noted, which lasted for at least two years, and in some cases was still present at the end of four years.

TREATMENT.—Rodet and Bonnamour¹² report on 127 cases of typhoid fever treated exclusively with Rodet's Serum (see MEDICAL ANNUAL, 1919, p. 454). They urge that the serum should be given as soon as possible, the best results being obtained before the twelfth day of disease. It may, however, have a favourable effect at any stage, provided the disease really is typhoid fever without any associated infection. The first injection consists of 15 or 20 c.c. The next injection is delayed until the temperature rises again, when 10 to 15 c.c. are given. The same rule applies to the third injection, which consists of 5 to 10 c.c. As a rule not more than three injections are required, and not infrequently two or even one are sufficient. If the temperature is not affected after three injections, it may be concluded that the case is not typhoid or that there is some superadded infection. The toxic symptoms are reduced to a minimum by the treatment. Among the 127 cases there were 14 deaths—a mortality of 11 per cent, which was reduced to 2.9 per cent if only the cases treated before the twelfth day were taken into account, and severe associated diseases, such as advanced pulmonary tuberculosis, septicaemia, and hepatic abscess, excluded. In several fatal cases the serum had a certain effect upon the typhoid infection, as was shown by the fact that in six autopsies the intestinal ulceration was already in an advanced state of repair, or even completely cicatrized.

The justification for the Surgical Treatment of Typhoid Carriers is to be

found in the fact that the gall-bladder forms the chief habitat of typhoid bacilli in the carrier. Spelthan collected 13 cases up to 1916 in which typhoid carriers had been successfully operated on; in 5 cholecystotomy and in 8 cholecystectomy had been followed by a clinical and bacteriological recovery. Since then 4 successful cholecystectomies on typhoid carriers have been performed. On the other hand, Dubs,¹³ from whose paper the above information has been obtained, records a case in which cholecystectomy was a complete failure, typhoid bacilli being still present in the stools three months after removal of the gall-bladder.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, ii, 2131; ²*Brit. Med. Jour.* 1919, i, 338; ³*Med. Suppl. Rev. Foreign Press*, 1919, 122; ⁴*Jour. Amer. Med. Assoc.* 1919, i, 402; ⁵*Ibid.* 463; ⁶*Med. Suppl. Rev. Foreign Press*, 1919, 444; ⁷*Med. Science*, 1919, 26; ⁸*Ibid.* 29; ⁹*Lancet*, 1918, ii, 881; ¹⁰*Jour. Amer. Med. Assoc.* 1919, i, 997; ¹¹*Med. Science*, 1919, 30; ¹²*Ibid.* 31; ¹³*Ibid.*

TYPHUS FEVER.

J. D. Rolleston, M.D.

SYMPTOMS.—Devaux¹ observed 215 cases of typhus with *nervous complications*, which he classifies as follows: 110 organic lesions, 59 of which were examples of polyneuritis, 46 of hemiplegia, and 5 of cerebellar syndrome; 70 had functional disturbances, of which 27 were difficulty in walking, 15 functional monoplegia, 8 deaf-mutism, 15 functional tremor, 4 bent back, and 1 amaurosis; 28 were examples of neurasthenia, with various pains and emotional troubles; 5 had psychic disorders, with mental enfeeblement; and 2 had previous organic infections aggravated by typhus. The neuritis sometimes appeared before the crisis, but most frequently developed during the first days of apyrexia. Polyneuritis was much more frequent than mononeuritis. In the upper limb the most frequent type was constituted by a lesion of the posterior branches of the brachial plexus, in which the supra- and infraspinatus, subscapularis, serratus magnus, and deltoid were involved. In the lower limb the external and internal popliteal nerves were principally affected. The prognosis of typhus neuritis generally is good. Apart from painful paræsthesia of the sole, which may last for months and even years, the motor and sensory symptoms disappear at the end of four to six months. Hemiplegias occurring at the beginning of attacks are rapidly fatal. Those which appear in convalescence, though not uniformly fatal, are nevertheless very grave. On post-mortem examination two kinds of lesions were found, either a large central abscess or extensive foci of cerebral softening.

The *surgical complications* of typhus are discussed by Moure and Sorrel,² who adopt the following classification: (1) Buccopharyngeal complications, including gingivitis, osteitis, and necrosis of the jaw, and cervical adenitis, which was either tuberculous or a mixed tuberculous and streptococcal infection. (2) Aural and mastoid complications due to bucco-naso-pharyngitis, which occurs frequently in typhus convalescents. Under ordinary treatment otitis media generally tended to heal, but some cases became chronic or were complicated by mastoid infection. The prognosis in post-typhus mastoiditis is good, if operation is carried out early enough to prevent brain complications. (3) Parotid infections. All forms of parotitis occur, from simple inflammation of the gland on one or both sides without suppuration, to actual gangrene. The most frequent forms seen by Moure and Sorrel were the suppurative and gangrenous. (4) Laryngeal complications. Two forms were noted, the one occurring at the height of the disease and constituting *laryngo-typhus*, and the other a late complication or sequel to a lesion of the submucosa and cartilages, causing laryngeal stenosis. (5) Ocular complications, which were classified by Dantrelle (*see* MEDICAL ANNUAL, 1919, p. 457) into those occurring at the height of the disease, and those occurring in convalescence. (6) Large subcutaneous

abscesses, of streptococcal origin, which are sometimes, but not invariably, due to septic punctures. (7) Gangrene, including bedsores and gangrene of the limbs caused by obliterative arteritis. (8) Erysipelas. In some cases it developed spontaneously, and was then situated on the face. Sometimes it was associated with lymphangitic abscesses: In others it followed operations, especially amputation for gangrene.

DIAGNOSIS.—The *Weil-Felix reaction*, which is now generally regarded as a specific test for the disease, is the agglutinating effect of the serum on a variety of *B. proteus* named X 19 which was isolated by Weil and Felix. The agglutination, which appears early in the disease, may occur in as high a dilution as 1-10,000 or more, and then diminishes, but persists after recovery for a period ranging from several weeks to several months. According to Hillenberg,³ the reaction in the great majority of cases remains positive for six weeks after the end of the disease, and subsequently the results are inconstant. In some cases, however, it may persist as long as twenty months. Normal serums, or serums from persons with other diseases than typhus, do not agglutinate beyond 1-50. A well-marked agglutination at 1-50 or above is generally regarded as specific of typhus. The reaction is of special value in children, in whom the course of the fever is often very mild and the rash and other symptoms are very slight or entirely absent. Sacquépée and Delavergne⁴ examined 114 specimens of serum from persons not suffering from typhus, and found that only one gave a slight agglutination at 1-50, and none in a higher dilution. The serum of 4 patients was examined on the fifth, sixth, and eighth days (2 cases). No agglutination occurred in the fifth-day cases; one of the eighth-day cases agglutinated rapidly at 1-50, but not in a higher dilution; the sixth-day case agglutinated well at 1-750; and the second eighth-day case at 1-1200. The serums of 6 typhus patients examined at a later stage were all definitely positive in dilutions varying from 1-600 to 1-1500. After the end of the febrile period the agglutinative power was examined in 4 cases in the second, third, twentieth, and twenty-first month respectively. In the first two cases there was a definite agglutination at 1-100 and 1-200, and in the last two there was no agglutination whatever.

Schürer⁵ attaches great importance to the psychical condition, facial expression, and blood-count in the early diagnosis of typhus. In striking contrast with the apathetic condition characteristic of enteric fever, the typhus patient is in a state of anxious excitement, with a lively flow of ideas. The facial expression is correspondingly completely different from that of the enteric patient, the facial muscles being tense, the conjunctivæ red and swollen, and the eyebrows frequently raised. Wrinkling of the forehead is particularly striking. The blood-count in the early stage of the disease is of special value in distinguishing typhus from influenza. In severe cases of influenza, which at a later stage are always complicated by bronchopneumonia, the number of leucocytes is always increased from the first, whereas in typhus there is a leucopenia, or at most a normal number of leucocytes. The neutrophil leucocytosis found by other observers in typhus is always due to complications, especially bronchopneumonia, and never occurs before the seventh or eighth day of disease. An increase in the number of leucocytes in the first few days of the disease will almost certainly exclude typhus. The blood picture in typhus is very similar to that of enteric, but leucopenia is not so constant and the relative lymphocytosis is less.

PROPHYLAXIS.—The prophylactic administration of 7½ gr. of Quinine daily for twelve days, which was originally suggested by Pecirka, was employed by Schöne⁶ in an epidemic at Greifswald, on the supposition that the blood is thereby rendered distasteful to the louse. None of the medical and

nursing staff on whom this method was tried contracted the disease, although nine days after the commencement of prophylaxis lice were still found on a typhus patient.

Otto and Rothacker⁷ inoculated about 750 persons against typhus with blood taken from patients at the height of the disease, or slightly after the temperature had become normal. The procedure was found to be free from danger; only 8 per cent of those inoculated had definite local or general reactions, and in the remainder there was no reaction whatever. Reactions were relatively more frequent in those who had been inoculated with blood taken from moderately severe cases with a slight eruption on the fifth to ninth day of the disease. Bacterial contamination could generally be excluded as the cause of the reaction. The inoculation, however, did not convey any protection against infection, as 61 cases, or 25 per cent, out of 244 inoculated, contracted typhus, as compared with 16 persons, or 20 per cent, among those who had not been inoculated. This was probably due to the fact that the uninoculated were exposed to infection for a relatively shorter time. It is also possible that quinine prophylaxis helped to protect the uninoculated. The benefit of inoculation, however, was shown by the fact that the mortality among the inoculated was only 28 per cent, as compared with a mortality of 44 per cent among the non-inoculated.

TREATMENT.—According to Muratet,⁸ Nicolle and Blaizot have immunized the ass and horse by making repeated inoculations of the spleen or suprarenal capsules of guinea-pigs suffering from experimental typhus fever. The Serum of the animals thus immunized was found to possess curative properties quite as well marked as those of antimeningococcal serum, which it closely resembled in its action. The serum was given in doses of from 10 to 20 c.c. a day subcutaneously, and the injections were continued until there was appreciable improvement in the patient's condition. It is important that the treatment should be commenced as early as possible.

During the last three years Hoefer⁹ has employed the serum of convalescents in the treatment of typhus. The blood was taken from the patient six days after the temperature had become normal, and the serum injected after addition of 0.1 per cent carbolic acid. Hoefer soon found that serum was not indicated in mild and moderate attacks, as such cases suddenly improve spontaneously; and he finally selected only those cases in which a fatal issue seemed certain. At first they failed to respond to any treatment, until large doses (1000 c.c. in doses of 250 to 300 c.c. daily) had been given subcutaneously, or smaller doses intravenously.

REFERENCES.—¹*Lancet*, 1919, i, 567; ²*Ibid.* 341; ³*Med. Supp. Rev. Foreign Press*, 1919, 23; ⁴*Med. Science*, 1919, 33; ⁵*Med. Supp. Rev. Foreign Press*, 1919, 122; ⁶*Ibid.* 1918, 384; ⁷*Ibid.* 1919, 164; ⁸*Med. Press and Circ.* 1919, i, 65; ⁹*Med. Supp. Rev. Foreign Press*, 1919, 71.

ULCER, TROPICAL. (See TROPICAL ULCER.)

ULCERS OF THE LEG.

E. Graham Little, M.D., F.R.C.P.

Prosser White¹ comments on the too frequent attribution of ulcers of the leg to syphilis or venous varicosity, and considers that the first causation is not nearly so common as has been supposed, a conclusion rendered probable by the incidence in women, in whom the affection is found by the author to be four times as common as in men, though syphilis is from three to eight times as common in men as in women. Fertile women are especially subject to this form of ulceration, which is rare in sterile women. This incidence is explained if one considers that the parturient woman is frequently the subject of phlegmasia, which is one of the chief causes of the intractable ulcer of the leg. A

PLATE XXXVII.

PERIOSTEAL REGENERATION OF BONE

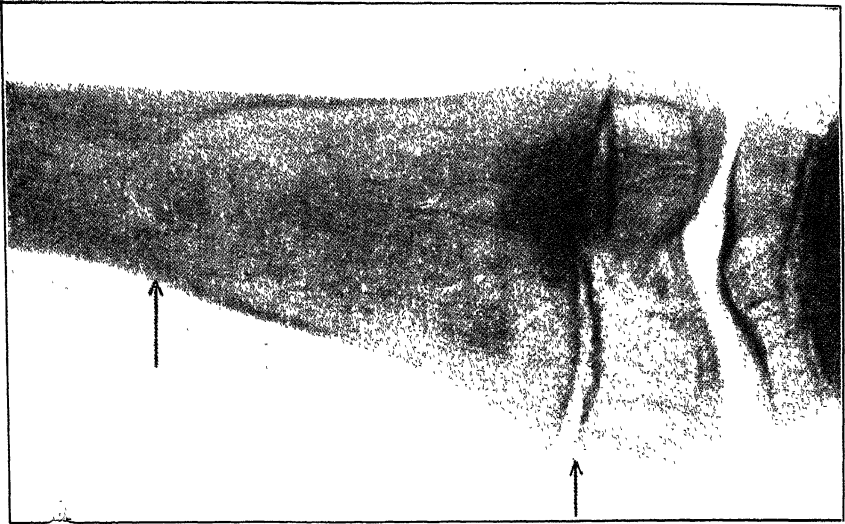


Fig. A.—Recent x-ray of case operated on in 1909. The lower third of the shaft of the femur was removed (between the arrows), and was accurately re-formed as shown.

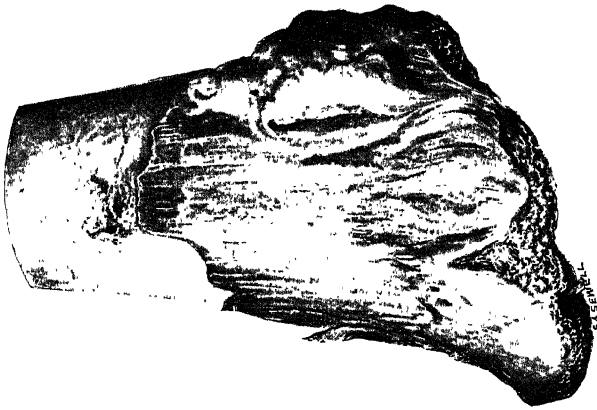


Fig. B.—Portion of bone removed, regeneration of which occurred as shown in *Fig. A*.

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second frequent causation is streptococcal infection, setting up an infective thrombus in a dilated vein beneath the skin infection.

The treatment advised is to bathe away the pus and organisms from the ulcer with frequent fomentations, or in the case of foul ulcers fomentation with 'Eau d'Alibour' is specially valuable :—

R Sulphate of Zinc	7 grm.	Camphor and Saffron	50 grm.
Sulphate of Copper	2 grm.	Water	300 grm.

Applied repeatedly to the parts on cloths with 3 to 5 parts of boiled water.

Before any permanent dressing is applied, the whole surface should be swilled over with the following paint :—

R Camphor		Acidi Picrici	℥v
Acidi Carbolici	āā 3 ij	Tragacanth.	℥j
Hyd. Perchlor.	gr. iv	Alcohol	℥vj

In small, very painful ulcers, a useful plan is to swab out the cavity three or four times consecutively with the paint mentioned or with **Silver Nitrate** in alcohol, and fill up the excavation with **Orthoform**. It follows from the views expressed that it is of great importance to prevent and to treat phlegmasia in its initial phases.

REFERENCE.—*Seventh Ann. Report London Derm. Soc.* 1919, 40.

UNUNITED FRACTURES.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Four years of war have provided such a plethora of material for the study of bone-grafting operations that it is possible for surgeons to survey the field from the standpoint of considerable experience. (For the writer's general conclusions on the subject, see *MEDICAL ANNUAL*, 1919, p. 93.) Heretofore discussions about bone-grafting have centred mainly around theoretical and academic questions, such as the rôle of the periosteum in the osteogenetic process, and the ultimate fate of the graft in its new position, while the all-important clinical standpoint has received but scant recognition.

So far as the osteogenetic power of periosteum is concerned, the controversy largely appears to hang round the point, what is meant by the periosteum? If merely the fibrous sheath which surrounds bone, then the periosteum is but a limiting and vascularizing membrane. If, on the other hand, the cambium or epiosteum layer lying between periosteum and bone, and rich in osteoblasts, is included as part of the periosteum, then most certainly the periosteum plays an important part in the production of bone. This bone-producing layer, lying between the periosteum and the surface of the bone, clings to the periosteum in children, whereas in adults it appears to belong more properly to the bone, and, in the absence of trauma or inflammation, to be inseparable from it.

If the periosteum is preserved with its clinging osteoblasts, as in the case of subperiosteal resection of bone in a child, new bone will be formed with mathematical accuracy in every case (*Plate XXXVII*). In adults, subperiosteal resection may or may not be followed by new bone formation, the result apparently depending to a large extent on whether or not the osteoblasts are detached from the bone in the process of separating the periosteum.

Davison¹ recommends transplantation of bone for defects of the head and neck of the femur. His conclusions are as follows :—

1. Recent fracture of the neck of the femur without impaction may be repaired by grafting a segment of fibula across the line of fracture (*Fig. 47*). To obtain ideal results the repair should be performed early, before the vitality of the capital fragment has been disturbed by lessening of its blood-supply. Under favourable conditions the union of the fracture resembles healing of

wounds by primary intention, and without doubt the capital fragment retains its integrity and persists as a vital portion of the femur.

2. Ununited fracture of the neck of the femur, with diminished vitality of the capital fragment, may be repaired by transplanting a segment of fibula across the non-union (*Fig. 47*). Under favourable conditions the transplant grafts to the lower fragment in a manner similar to that in recent fractures. In the capital fragment the process is different. It simulates the healing of

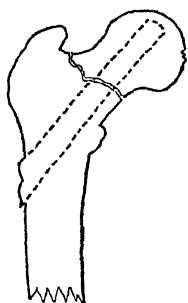


Fig. 47.—Diagram of transplantation of segment of fibula across a fracture of the neck of the femur at an angle of 135° with the shaft of the femur.

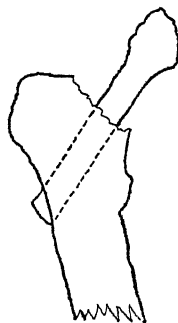


Fig. 48.—Diagram illustrating method of transplantation of the upper part of the fibula into the upper end of the shaft of the femur to remedy loss of head and neck of femur.

wounds by granulation. There is a stimulation of osteogenesis by the transplant, with projection of new bone-cells into the devitalized fragment, which acts only as a frame-work for the deposition of new bone. The old bone is gradually absorbed as it is replaced by new.

3. The head of the femur, destroyed by injury or disease, may be replaced and fair function re-established by transplantation of the head and upper part of the fibula into the upper end of the shaft of the femur in such a manner that the articular surface of the head of the fibula will articulate with the acetabulum (*Fig. 48*).

See also *ELECTROTHERAPEUTICS*, p. 28.

REFERENCES.—¹*Surg. Gyn. and Obst.* 1919, Aug., 142.

URETER, SURGERY OF.

J. W. Thomson Walker, M.B., F.R.C.S.

Mufson¹ describes a case of *bilateral congenital stricture of the ureter*, and reviews the literature. He states that only eight cases are recorded, most of them occurring before the age of five years. The cause is unknown, although it is probable that the stricture may originate in the valves naturally found in the embryo. The common positions are the uretero-pelvic junction, the brim of the bony pelvis, and the vesical end of the ureter. Bilateral hydronephrosis usually develops.

Heilst² holds that *strictures of the lower end of the ureter* occur more frequently than is commonly believed, and not a few of them are of the inflammatory acquired type. Strictures of this part of the ureter may result from infection spreading from an adjacent seminal vesicle. Strictures in this locality play an important rôle as the etiological factor in some of the obscure infections of the kidney. The importance of early diagnosis and treatment before serious changes occur in the kidney is pointed out.

In a report on *war traumatism of the kidney and ureter*, Rochet³ states that he found only five genuine cases of wound of the ureter. In all cases the only treatment was nephrectomy, which was successful always without compromising the renal function. In discussing this report, Marion stated that he had seen five ureteral wounds. While such wounds may be very grave and give rise to severe complications leading to pyelonephritis or pyonephrosis, and require nephrectomy, yet in certain cases there may be complete recovery. One of the important factors in recovery is perfect drainage of the wound.

In an article on *the diagnosis of ureteral calculi*, Eisendrath⁴ states his view that little reliance can be placed upon clinical symptoms in diagnosis. Typical ureteral colic may be present (a) when particles of tumour, blood-clots, or masses of pus escape down the ureter, (b) in ureteral infection, (c) nephritis, (d) appendicitis, (e) tabes, (f) congenital or acquired stricture of the ureter, (g) kinking of the ureter in cases of movable kidney or compression of the ureter. The author recommends the more frequent use of the following modern methods of diagnosis; (1) Shadowgraph catheter; (2) Pyelography; (3) Stereoscopic x-ray plates; (4) Cystoscopy and ureteral catheterization; (5) Intensification of suspicious shadows. Cases are quoted to show the value of the opaque catheter and pyelography in differentiating shadows thrown by extra-ureteral conditions such as calcified glands, gall-stones, and other lesions, which throw shadows along the course of the iliac and lumbar portion of the ureter.

Kretschmer⁵ discusses the *localization of ureteral stone by means of the opaque ureteric bougie*. In cases where the supposed calculus shadow falls on that of the opaque bougie, two exposures on the same plate are taken with the bougie in position. The position of the tube is changed very slightly for the second exposure. By this method a shadow is thrown by an extra-ureteral opaque body which is in line with the ureteral catheter in one exposure, but is thrown out of the line of the catheter in the second exposure.

The retrograde movement of ureteral calculi forms the subject of an article by Kretschmer.⁶ The three chief sources of error in the x-ray diagnosis of stone in the ureter are; (1) Failing to demonstrate a calculus when present; (2) A wrong interpretation of shadows found in the plate; (3) Failing to find at operation a calculus which was definitely demonstrated by the x ray in the ureter. The third source of failure is due to retrograde movement of calculi in the ureter. Two cases in which this occurred are related. The movement takes place: (a) In cases where the ureter is dilated, from stricture or from the presence of the stone. When the patient is erect, the stone will lie in the lowest part of the ureter; when the patient is on his back or in the Trendelenburg position, the stone travels towards the kidney; (b) Where no dilatation is present there must be reversed peristalsis of the ureter. It has been demonstrated by the x rays, and there is, Kretschmer states, experimental proof in animals, that fluid can pass up a normal ureter when placed in the bladder. In further support the analogy of the intestine is drawn. Eight cases of retrograde movement of ureteral calculi are quoted from the literature.

Eisendrath⁷ discusses the *indications for operation in ureteral calculi*, and relates a number of cases. Operative interference is indicated in the following cases: (1) When renal colic recurs or infection persists after repeated attempts have been made to deliver the calculus by non-operative methods, and there is practically no change in the location of the calculus; (2) When there is evidence of stricture formation following (a) the spontaneous expulsion of a calculus, (b) its delivery by non-operative methods, (c) ureterotomy; (3) When a fistula is present either (a) as the result of perforation of the ureteral wall by a calculus, or (b) above a stricture; (4) When a severe degree of renal

infection is present and the calculus is impacted in the ureter ; (5) Calculous anuria cases should be operated on as soon as the diagnosis of the location has been made ; (6) In cases of either aseptic or infected hydronephrosis, immediate operation is indicated ; (7) Many of the cases where an attempt has been made to save the kidney may be benefited by catheter drainage or renal lavage ; (8) Where there are bilateral ureteral and renal calculi with acute complications, the kidney should be operated on first ; if there are no acute complications, the better functioning kidney should be operated on first ; occasionally simultaneous bilateral operation is advisable.

Peterson⁸ gives an experimental and clinical report on *the effect on the kidney of ureterovesical anastomosis*. The different methods are described. Cuffley's method of implantation of the ureter into the intestine consists of splitting the serous and muscular coats for $\frac{3}{4}$ in., and entering the lumen of the bowel through a small stab-wound in the mucosa. The ureter is pulled well into the lumen by means of an anchoring suture placed through its split end, and tied $\frac{3}{4}$ in. below its entrance. The serous and muscular layers are then approximated around the ureter. One stay suture is placed $\frac{1}{4}$ in. above the site of the anastomosis. Stiles's method consists in entering the bowel by a stab wound, and approximating the intestinal wall over the ureter without further dissection. The wall of the ureter is also caught in these sutures. He omits the splitting of the ureter, and the stay sutures. Furniss penetrates a double fold of the bladder wall with an artery forceps, and pulls the second ureter through both openings made by the forceps. The ureter is secured to the bladder wall by a few interrupted sutures at its lower entrance to the bladder, and the end is permitted to hang free in the cavity of the bladder. Mann makes two parallel incisions $\frac{1}{4}$ in. in length, and $\frac{1}{2}$ in. apart at right angles to the long axis of the bladder, extending down to the mucosa. This seromuscular bridge is undermined, leaving the mucosa intact. A small stab-wound is made through the mucosa at the site of the lower transverse incision. The severed ureter, having been split for $\frac{1}{4}$ in. and armed with fine catgut, is pushed beneath the bridge from above downward, and anchored to the inner surface of the bladder wall half an inch below the opening. No suture is placed in the ureter except those put through the flap. Peterson experimented on dogs. Unilateral implantations were made on 18 dogs, and bilateral on 3. Cuffley's technique was used in 8 cases, and observations on end-results were made from one day to five months after the operation. Stiles's technique was carried out in 8 cases, 5 operations were done by Mann's method, and 3 by that of Furniss. In reviewing the 24 experiments, the author states that normal kidneys and ureters were found in 15 instances, slight hydronephrosis in 2, marked hydronephrosis in 1, miliary abscess of the kidney in 1, pyonephrosis in 1, normal kidney and hypertrophied ureter in 2, and ureter pulled out in 2. Fifteen implantations (62.5 per cent) were complete successes ; normally functioning kidneys were found in 19 (80 per cent) ; complete failure, from stenosis, infection, and pulling out of ureters, occurred in 5 cases (20 per cent). The successful outcome of ureterovesical implantation depends on the technique. There must be (1) rigid asepsis, (2) prevention of leaking or compression, (3) avoidance of sutures entering the lumen of the ureter, (4) the avoidance of clamping the ureter. Twenty-one cases operated on in the Mayo clinic were reported. Fifteen had extensive resections for tumour of the bladder and implantation of one ureter ; 4 had uretero-vaginal fistula ; in 1 the ureter opened into the urethra ; and in 1, one ureter opened into a diverticulum. The following conclusions were drawn : (1) From experimental and clinical observations, a normal or almost normal kidney and ureter should result after implantation of the ureter into the

bladder; (2) The utmost care to minimize the operative trauma must be observed; (3) The placing of a forceps over the end of the ureter must be avoided; (4) No suture should enter the wall or lumen of the ureter other than the anchoring suture placed in the split extremity of the ureter; (5) The approximation of the wall of the bladder must be accomplished without undue compression; (6) When marked dilatation of the ureter has occurred prior to surgical interference, and when it is necessary to implant the ureter under tension, a successful result is very doubtful, and ligation is preferable to any attempt at implantation.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, July 26, 262; ²*Ibid.* 1918, Nov. 23, 1722; ³*Jour. d'Urol.* 1918, vii, 337; ⁴*Surg. Gyn. and Obst.* 1918, Nov., 461; ⁵*Ibid.* 472; ⁶*Jour. Amer. Med. Assoc.* 1918, Oct. 26, 1355; ⁷*Ann. Surg.* 1919, Aug., 192; ⁸*Jour. Amer. Med. Assoc.* 1918, Dec. 7, 1885.

URETHRA, DISEASES OF. J. W. Thomson Walker, M.B., F.R.C.S.

Repair of Urethral Defects following Injury.—Cathelin¹ reported 94 cases of wounds of the genito-urinary organs, 37 of which were urethral fistulæ. In about one-third of these cases the genital function was abolished. Almost every wound of the external genito-urinary region is accompanied by a concomitant injury of the thigh or pelvis. The treatment of urethral fistulæ is by the method of cutaneous inversion (penile or scrotal skin) with bipolar section. The operation is almost always successful, and there is no stricture. Autoplastic penile and urethral surgery is a delicate and lengthy procedure requiring much patience, and long intervals must elapse between the successive operations. The conclusions of the Conference of French Urological Centres before which Cathelin's report was brought were that there was no single method of treating urethral fistulæ. If the method of cutaneous inversion gave good results, especially in small fistulæ, the various redoubling methods and autoplastic strips or mucous transplantation should not be forgotten, especially in cases with extensive destruction of the urethral walls. In primary operations of urgency in the genito-scrotal region, excision should be as sparing as possible.

The early and late treatment in traumatic lesions of the deep urethra was a subject set for discussion at the Fourth Meeting of the Genito-Urinary Centre in France.² Heitz-Boyer pointed out that where the urethral lesion was isolated, the treatment of the soft parts requires as much care as that of the urethra itself. This consists in excising damaged tissues and avoiding immediate suture in the majority of cases. The treatment of the urethra varies with the case. If the lesions are limited and recent, immediate suture with a retained catheter is carried out. If the lesions are very extensive and of more than 48 hours' duration, it is necessary to leave the urethral gap open and to drain the bladder above the pubes. The treatment of the associated lesions consists in immediate suture of the anus, if possible, and producing temporary constipation. Lesions of the lower rectum rarely permit of immediate suture, and it is better to do a colotomy at once. If diversion of the urine is also necessary, it is better to do this by the perineum. When pelvic cellulitis is present, drainage may be assisted by resection of the coccyx. Where vesical injuries are present, it is always necessary to perform suprapubic cystostomy. Lesions of the pelvic bones necessitate very careful cleansing and free drainage, with removal of a portion of bone.

Marion drew the following conclusions: Where no obstruction due to the injury existed in the posterior urethra, the ends of the canal should be found, interposed tissue resected, and the urethra reconstructed gradually by approximation of the peri-urethral tissue if urethrorrhaphy is impossible. Where urethrorrhaphy is possible, no catheter should be left in the urethra. Where

reconstruction of the canal has been carried out, it is necessary to have a sound in the urethra, or to leave a filiform bougie which will act as a guide to the passage of sounds later. When stricture develops, dilatation or internal urethrotomy becomes necessary. Where a urethrorectal fistula develops, the urethra and rectum are first isolated, and then openings are closed and periurethral tissue is interposed between the two. Where there is extensive destruction of the perineal tissues, autoplasic operations are preferred, using the skin of the scrotum and thigh. Total destruction of the posterior urethra, with destruction of the anus, is beyond repair. In these cases cystotomy or a perineal urethrostomy, with a colostomy, is necessary.

Adams³ describes a case of gunshot injury to the urethra where a gap of 5 in. existed between the severed ends. He placed in this a tube of Baer's membrane surrounding a catheter, and covered it with flaps of scrotal and penile skin. The bladder was drained suprapubically. The wound healed and the continuity of the urethra was restored.

Legueu⁴ reports three cases in which he repaired urethral defects by tubular grafts of vaginal mucous membrane. In one case there was a perineal fistula with occlusion of the penile urethra from this to the meatus. The sclerotic urethra was excised, and a tunnel made through the glans penis. A rectangular segment of vaginal mucosa removed in the course of a colpoperineorrhaphy was rolled round a 26 F. bougie and stitched so as to form a tube which was placed in the gutter and tunnel left by excision of the urethra. The superficial structures were united in two layers over this. Suprapubic drainage of the urine is essential in this operation.

Benedict⁵ recommends the use of grafts of the whole thickness of the scrotal skin for repairing large cutaneous defects of the penis. The granulating surface should be free from infection, and the flap is cut at least half as wide again as will cover the denuded area. It is left attached at its base, which is severed at the end of a week. An illustrative case is described.

Duran and Rico⁶ record two cases of repair of urethral defects by transplantation of a portion of the saphenous vein.

Telford and Norbury⁷ describe a case of perineal fistula where the removal of a large mass of scar tissue was necessary. A gap of 1½ in. in extent separated the cut ends of the urethra, the posterior end being almost flush with the triangular ligament. The prepuce removed from a year-old infant was shaped to fill this gap, moulded round a metal catheter, and the soft parts united over this. Fifteen weeks after the operation no stricture had developed.

Le Fur⁸ reports a case where the urethra was destroyed for 7 or 8 cm., there being no trace of the inferior, lateral, or superior walls. There was in addition left ischiopubic pelvic fracture, and further lesions necessitating double castration. The urethra was reconstructed by a series of urethral and perineal autoplastics by the strip method. The new canal shows no tendency to stricture. The following principles essential to the treatment of all urethral fistulae are laid down: (1) Wide removal of all cicatricial tissue. (2) A wide freshening-up of important surfaces. (3) The necessity for drawing off the urine (perineal or hypogastric), and of avoiding the retention sound.

Stricture.—Schmidt⁹ points out that the cause of failure in operations on urethral stricture may be the neglect to split the entire urethra in the stricture area, and to remove the surrounding inflammatory tissue. If at all possible the upper wall of the urethral mucous membrane should be preserved intact. This permits the catheter, when correctly passed, to preserve contact with urethral mucous membrane along the whole urethra. Another cause of unsatisfactory results in treating stricture is that instruments may leave the urethra and enter the bladder at a point above or below the internal meatus. In such cases a

subsequent operation is necessary to correct the false passage and remove the chronic inflammatory tissue. Schmidt recommends excision of a portion of the dilated urethra behind the stricture to prevent dribbling at the end of micturition.

Hypospadias.—Adlercreutz¹⁰ used the following method in treating a case of complete hypospadias: a piece of the internal saphenous vein was implanted as a substitute for the urethra. The peripheral end of the vein was sutured to the freshened end of the urethra, the central end being pulled through an opening made in the glans. The bladder was drained suprapubically. A stricture formed, and further operations were necessary.

Epispadias.—Young¹¹ describes an operation for epispadias which he has introduced. The operation usually employed uses the gutter on the dorsum of the corpora cavernosa to form a urethral tube, bringing together the inner edges of two longitudinal incisions, one on either side of the groove, and then dissecting the new urethra free. Young modifies this procedure by separating the corpora cavernosa, while leaving the new urethral tube attached by its whole length to the left corpus cavernosum. The corpora are well separated, so that they are only held together by the skin on the under surface of the penis, and a deep groove for the reception of the urethra is left between them. The left corpus cavernosum is sufficiently mobilized to allow it to be rotated, carrying with it the urethral graft. The new urethra is buried by bringing together the two corpora cavernosa above it. A dorsal line of sutures brings together the two halves of the glans, and the skin edges along the dorsum of the penis are approximated. Two successful cases are recorded.

Disorders of the Sexual Function in relation to Conditions in the Posterior Urethra.—Huhner¹² points out that very pronounced symptomatic effects may result from apparently slight pathological changes. A slight congestion in the region of the verumontanum, which may be overlooked or disregarded by the inexperienced, may be the cause of grave symptoms. On the other hand, the most gross pathological lesions in the posterior urethra, which are sometimes discovered in a routine examination, may cause no psychic or functional disturbance whatever. Impotence and other functional and psychic conditions result from changes in the posterior urethra, and the treatment that Huhner advises is to get rid of these changes by instillations of silver nitrate. Absolute sexual rest is insisted on.

REFERENCES.—¹*Jour. d'Urol.* 1918, vii, 267; ²*Presse Méd.* 1918, Dec. 26, 669; ³*Brit. Jour. Surg.* 1919, April, 494; ⁴*Jour. of Urol.* 1918, Oct., No. 2, 5; ⁵*Surg. Gyn. and Obst.* 1918, Nov., 435; ⁶*Ibid.* 1919, May, 434; ⁷*Lancet*, 1919, i, 177; ⁸*Paris Chir.* 1917, ix, 679; ⁹*Surg. Gyn. and Obst.* 1919, March, 261 (abstr.); ¹⁰*Surg. Gyn. and Obst.* 1919, May, 435; ¹¹*Jour. of Urol.* 1918, xi, 237; ¹²*Med. Rec.* 1919, April 12, 596.

URINE, ABNORMAL CONSTITUENTS OF.

John D. Comrie, M.D., F.R.C.P.

A test solution for *albumin*, said to be as delicate as, and more convenient of application than, nitric acid, is given by Stewart.¹ It consists of: picric acid 10 grm., magnesium sulphate 400 grm., citric acid 20 grm., distilled water 1500 c.c. The urine is placed in a tube, and the test solution is pipetted beneath its surface, causing a white coagulum at the plane of contact if albumin be present.

A very simple rough test for the progress of a case of *acidosis* is devised by Mitchell.² His test solution, which has a red colour, consists of 145 c.c. water, 33 c.c. Lugol's solution of iodine, and 2 c.c. saturated solution of picric acid, mixed and heated on a water-bath. To this the urine is added quickly, in small quantities, from a burette. In cases of severe acidosis, 2 or 3 c.c. of urine discharge the red colour; in cases of moderate severity, 8 or 10 c.c. may be

required; and the progress or retrogression of the case is shown from day to day as a greater or less quantity of the urine is required to discharge the colour.

The influence of acid phosphates on the elimination of ammonia in the urine and on the production of symptoms of acidosis, is discussed by Marriott and Howland.³ By the administration of acid sodium phosphate they were able to show that the ammonia formation is inhibited, and they consider that acidosis occurring in the course of nephritis is due to the retention of this salt in the blood.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, Sept., 1050; ²*Med. Rec.* 1919, March, 404; ³*Arch. Internal Med.* 1918, Oct., 477.

URINE, CLINICAL PATHOLOGY OF.

Oskar C. Gruner, M.D.

A. CHEMICAL.

1. *Albumin*.—Stewart¹ gives the following method for use when many specimens are to be examined. The reagent is: wet picric acid 10, mag. sulph. 400, citric acid 20, and distilled water 1500. A row of test-tubes may be put up, and 4 c.c. of the reagent placed in each. A glass tube is now dipped in the centrifuged urine, and placed in the corresponding test-tube. On removing the finger the reagent will rise into the glass tube, and a contact ring will form within if albumin is present. Either the same glass tube is rinsed and used for the next sample, or a series of tubes will serve to give a reaction in a series of cases one after the other, and in the same rack.

Petersen² uses the following reagent instead of the Esbach reagent: phosphomolybdic acid 2 grm., concentrated sulphuric acid 6 grm., kaolin 6 grm., distilled water to 400 c.c. It is used like Esbach's reagent, but has the advantage of giving a result in six hours.

When cedema occurs in infants without albuminuria, this is regarded by A. Meyer³ as evidence of scurvy. Such cases need grapes, citric acid, water-cress, and salt-free diet.

2. *Blood*.—De Jager⁴ gives two tests: (a) Add a few drops of zinc chloride solution to the urine, filter, and overlay with a mixture composed of 1 c.c. conc. HCl, 9 c.c. alcohol, and 2 drops of 0.5 per cent sodium nitrite; this gives an emerald green; (b) A solution of 0.2 grm. rhodamin in 50 c.c. alcohol is boiled with 5 grm. zinc dust and 4 c.c. 10 per cent soda till there is no more colour. This reagent will give a red colour with a ten-millionth part of dried blood.

3. *Glucose*.—C. V. Bailey⁵ discusses the nature of renal diabetes. There are two types: (a) Cases where the blood-sugar is normal or subnormal, and glycosuria; (b) Cases with constant amount of glycosuria, though the rate of urinary excretion varies. The first form is greatly influenced by blood changes, the second form is not. The conclusion given is that renal diabetes is really a renal glycosuria, and not dependent on a temporary increase of the blood-sugar, as long as there is no suggestion of diabetes mellitus. In order to make the diagnosis, it is necessary to take a sample of the blood at the same time as the urine, first thing in the morning, during the fasting period from both food and drink.

Langstroth⁶ seeks to discover the 'kidney threshold for glucose', in order to distinguish between renal glycosuria and diabetes. He takes samples of blood every half-hour after giving carbohydrate food, and ascertains the concentration of the sugar in the blood at that time at which the urine first shows sugar by the glucosazone test.

De Massary⁷ uses the presence of glucose in the urine as a sign indicative of need for lumbar puncture in cases of cerebrospinal fever.

4. *Colloidal Nitrogen*.—Labbé and Daughin⁸ estimate the ratio between

colloidal and total nitrogen in the urine in order to test the functional capacity of the liver. If the ratio is 5.5, the finding suggests cirrhosis of the liver; if 6.6, cancer. In a case of diabetes nearing coma it rose to 7.

5. *Ammonia*.—The presence of ammonia is useful in deciding the functional capacity of the kidney. However much alkali a normal person ingests, the urine will always contain ammonia, whereas if there be nephritis the ammonia disappears early, because the alkali is retained in the circulation and has time to neutralize acid products.⁹

6. *Creatine and Creatinine*.—It appears to be decided¹⁰ that creatinuria is the outcome of metabolism and is not an expression of the diet. Some observers conclude that protein becomes creatine, which goes to the muscles, and that if there be an excess the muscles will reject it and thus lead to its appearance in the urine.

Marcelle Wahl¹¹ gives a detailed study of the relations between these two bodies. He finds an elimination of creatine during inanition, accompanied by acidosis. He sees a close relation between the liver and the excretion of these substances, inclining to believe that the liver forms creatinine—of which some goes to the muscles and becomes creatine there, while the residue goes to the urine. The acidosis above named is the expression of simultaneous failure to utilize the carbohydrates. Creatinine-content gives an insight into the amount of potential energy in the muscles; it increases during work, fatigue, in fever, and in wasting diseases; and, when studied in conjunction with the total nitrogen and the patient's weight, it enables a good insight to be obtained into the general metabolism of the case. The fraction creatine/creatinine is from 4 to 17 in cirrhoses (increased), shows no change in simple catarrhal jaundice, and in cases of cancer of the abdomen shows whether the liver is involved or not, because in cancer without involvement of the liver the creatine is almost absent, and when the liver is involved an abundance of creatine appears in the urine.

7. *Leucin*.—R. W. Allen¹² suggests that leucin is much more frequently present in morbid urine than is suspected, as he found abundance of crystals in a case as long as the urine was examined within two hours, whereas it had all disappeared on standing, presumably owing to proteolytic ferment action.

8. *Indican*.—Takeuchi¹³ uses the following test: 5 c.c. urine are treated with lead acetate. The filtrate receives several drops of acetic acid, and 2 to 3 c.c. chloroform and 1 to 3 drops of Takeuchi's reagent (pot. iod. 8.3, iodine 8, pot. brom. 6, water 100). After shaking several times, 5 to 6 c.c. fuming HCl are added. After shaking again, the chloroform is drawn off, washed with water to remove acid, and treated with a few drops of sodium hyposulphite to remove the iodine, and the remaining blue solution is placed in the colorimeter. This gives a complete value for the whole of the indoxyl.

W. J. Schuyler¹⁴ points out that indicanuria is very common in children, as a result of wrong diet. He argues that it goes with physical disturbances (outbursts of temper, fickle appetite, craving for adult foods, low blood-pressure, liability to catch cold, rheumatic pains, and so forth). These symptoms arising from abnormal proteins in the food go with Berger's finding¹⁵ of eosinophilia in infants who were fed with unsuitable proteins.

B. MICROSCOPICAL.

Rosenthal¹⁶ discusses the interpretation of laboratory findings at length, mentioning, among other items, the significance of casts and of pus. Hyaline casts are of no significance unless numerous and unless supported by the presence of cellular and other casts. Granular casts are a guide to prognosis if the granules are coarse, as they then signify a severe inflammatory process.

Pus casts indicate acute pyonephrosis. Cylindroids do not mean disease. He recommends the examination of 24-hour specimens solely. For preserving the urine, a small amount of chloroform may be added. Halverson and Schulz¹⁷ have shown that thymol, used as a preservative of urine, does not spoil the specimen for quantitative examinations.

Mucus Deposit in Urine.—Billington¹⁸ shows that the amount of such deposit is regularly greatly increased in persons the subject of febrile or other disease. It forms at the junction of the upper and second fourths, and is composed of interlacing strands. The structure becomes very distinct when the deposit is washed and treated with one drop of 10 per cent tannic acid. It will now take up watery stain, and appears like a mass of gigantic spirochaetes, which stain with Indian ink. Very high powers reveal the presence of granules. The source of the material is not known, but the above characters serve to distinguish this form of pathological substance from simulacra.

C. FERMENT CONTENT.

Winslow¹⁹ discusses the value of estimating the diastase content of both blood and urine in order to determine the functional power of the pancreas. A given sample of urine will keep for several days under a film of toluol without the diastase power being lost. Taking as standard the amount of a 1-1000 solution of starch which 1 c.c. of the urine will digest in 30 minutes at 38° C., viz., 16 to 32 for urine (8 to 16 for blood), the diastase content remains unaltered in amyloid kidney, and is diminished when the pancreatic duct is obstructed. The details of the test are simple. A series of tubes is put up, into each of which is placed a progressively diminishing amount of the fluid to be tested. To each tube is added the same quantity of 0.1 per cent starch, and after half an hour's incubation a few drops of iodine solution are added to each tube. The last tube to show permanent blue provides the figure required.

D. BACTERIAL CONTENT.

1. *Tuberculosis.*—E. M. Watson²⁰ reviews the various methods advocated from time to time for detecting tubercle bacilli in urine, and concludes that the failures are because of not taking enough urine, and not obtaining the *whole sediment* from that sample. Where urinary salts are abundant, the slides should be placed in 5 per cent (HCl) acid alcohol for two minutes, and then fixed in the flame, and placed in a hot bath of carbol-fuchsin for ten minutes. The remaining procedure is as customary. For vesical tuberculosis, the bladder should be irrigated and the washings searched for the bacilli. He shows that, though microscopic study does not give 100 per cent of successes, yet the use of guinea-pigs has given negative results where tubercle bacilli were found in the laboratory.

2. *Influenza.*—Henderson²¹ reports the presence of streptococci in the urine in influenza cases. They are found amongst the pus cells in the deposit. There was no pyelitis, cystitis, or urinary decomposition to account for them, and they were cultivated on trypsin broth and on a glucose broth containing ammonium carbonate.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1918, lxxi, 1050; ²*Ugeskrift f. Læger*, 1918, lxxx, 1054; ³*Ibid.* (quoted *Med. Review*, 1919, 12); ⁴*Pharm. Zentralbl.* 1917, lviii, 442; ⁵*Amer. Jour. Med. Sci.* 1919, clvii, 221; ⁶*Ibid.* 201; ⁷*Progrès Méd.* 1919, 260; ⁸*Ann. de Méd.* 1918, No. 5, 314; ⁹*Jour. Amer. Med. Assoc.* 1918, lxxi, 1140; ¹⁰*Ibid.* 166; ¹¹*Arch. d. Méd. Exp.* 1918, xxviii, 105-54; ¹²*Brit. Med. Jour.* 1919, ii, 238; ¹³*Jap. Med. Lit.* 1918, iii, 74; ¹⁴*N.Y. State Med. Jour.* 1918, xviii, 22; ¹⁵*Arch. of Ped.* 1916, xxxiii, 742; ¹⁶*N.Y. Med. Jour.* 1919, cx, 108; ¹⁷*Jour. Amer. Chem. Soc.* 1919, xli, 440-2; ¹⁸*Lancet*, 1919, ii, 325; ¹⁹*Hospitalstidende*, 1918, lxi, 832; ²⁰*Amer. Jour. Med. Sci.* 1918, clvi, 636-43; ²¹*Glasgow Med. Jour.* 1919, ix, 257.

URINE RETENTION. (See SPINAL CORD, INJURIES OF).

UTERUS, DISORDERS OF.

W. E. Fothergill, M.D.

Malignant myoma, or *malignant leiomyoma*, as the authors prefer to call it, has been studied anew by M. S. Profer and B. J. Simpson.¹ They believe that if all fibroids were examined, the proportion of malignant growths found amongst them would be greatly increased. They examine growths free of charge in the New York State Institute for the Study of Malignant Disease, and have found 22 malignant tumours amongst 357 myomata: about 6 per cent. Kelly and Nobel, Tracy, and Murphy find the incidence of malignant growths in relation to fibroids to vary between 1 and 2 per cent; Gardner and Winter find about 3 per cent. Sixteen of the twenty-two cases studied by the writers had pre-existing fibroids. Histologically, the cases fall into three groups, according to their variation from the smooth-muscle type: (1) Those closely resembling myomata, composed of long spindle cells with rod-shaped nucleus having rounded ends, mitotic figures being infrequent; (2) Those composed of shorter, plumper spindle cells, having oval and vesicular nucleus with numerous typical and atypical mitotic figures; (3) Those that show great variability in the morphology of the cells, and consist of short spindle cells, large round cells, and numerous giant cells, single or multiple nuclei, and presenting great irregularity of the chromatin elements. This division into three types is probably purely artificial, and only represents stages in the growth of the tumour. Recurrence is the usual sequel to the removal of these growths in their later stages. It is well to emphasize the warning of Geist, that the treatment of 'fibroids' by x rays or radium is dangerous in women past 40 years of age, because, if malignant change has taken place, this treatment is of no avail and valuable time may be lost.

Infantilism of the Uterus.—Emil Novak² regards the infantile uterus as of clinical importance for two reasons: (1) The frequency with which it is associated with aberrations of menstruation; and (2) The fact that it often constitutes the anatomical basis for sterility. He describes the foetal uterus, the uterus of infancy and childhood, and the uterus at puberty. He inclines to the opinion that it would be useful to describe the organ as consisting of three portions: body, isthmus, and cervix, the isthmus corresponding to the lower uterine segment of obstetricians. As to the types of hypoplasia met with, Novak points out that the hypoplasia may show itself in either of two forms, an arrest of growth or an arrest of differentiation; i.e., the uterus may remain small, though there be the normal relation between body and cervix; or it may grow to full size, but retain the relatively large cervix and small fundus of the child's uterus. All possible grades of hypoplasia are found between these two forms.

As to clinical features; in one set of cases amenorrhœa is the predominant symptom; in another dysmenorrhœa. In other cases the menstrual flow is excessive. Amenorrhœa goes with a greater degree of hypoplasia than does dysmenorrhœa as a general rule. It is associated with late puberty, early menopause, absence or defect of secondary sex characteristics, and adiposity.

The causation of uterine hypoplasia is discussed in terms of the endocrine glands. Novak says that as spasmodic dysmenorrhœa is often found with hypoplasia and also with ante flexion of the uterus, it is not surprising that the ante flexion has been blamed for the pain: "*nulla dysmenorrhœa nisi obstructiva*", as Marion Sims put it. But as a probe can easily be passed into the uterus during the height of the menstrual pain, this view is obsolete. Sharp ante flexion is constantly found without dysmenorrhœa, and *vice versa*. Novak inclines to the view that, the musculature of the hypoplastic uterus being at

fault, the organ cannot properly accommodate its endometrium, enlarged and congested by the premenstrual changes. The pain is cramp-like, contractions endeavouring, so to speak, to expel the endometrium. This view is supported by the fact that spasmodic pain ceases when the flow is established and the swelling of the endometrium is thereby reduced. Novak regards sterility in these cases as a manifestation of disordered physiology rather than of pathological anatomy, for the endometrium is structurally normal.

As to treatment, **Organothérapie** has been tried by many on the slim basis of the facts that already seem fairly well established. The results have been very disappointing, which is natural, since the developmental defects of the organ arise long before the symptoms appear which attract attention to them. Apart from the theoretical possibility of the use of endocrine glands, there remains the practical treatment of amenorrhœa, dysmenorrhœa, and sterility in cases of uterine hypoplasia of various degrees and kinds.

Amenorrhœa is far more frequently constitutional than local. But when it is due to a local anatomical defect of the genital system, its treatment is much to be deplored.

The treatment of spasmodic dysmenorrhœa is bad. The two drugs most effective in relieving the pain are morphia and alcohol, which for obvious reasons are specially to be avoided. The usual surgical measure is **Dilatation of the Cervix**. Formerly it was accompanied by curetting, for which there was no reason and which secured no advantage. Halden's figures show that dilatation fails entirely in 30 per cent of cases, gives temporary relief in 30 per cent, and gives relief lasting for a year and more in 40 per cent. As for the various plastic operations on the cervix, such as those of Sims, Dudley, Pozzi, and Frank, Novak says that he can see absolutely no excuse for their performance. All of them are based on the erroneous impression that dysmenorrhœa is due to cervical stenosis.

The surgical treatment of sterility is also condemned by Novak. He hopes that the day will come when the symptoms "associated with uterine hypoplasia will be successfully treated by correcting the endocrinopathy responsible for the uterine defect".

Endometritis.—In a paper on the physiology and pathology of the endometrium, L. W. Strong³ states that the signs of inflammation in the mucosa uteri are masked because exudates of leucocytes, round cells, and plasma cells are all to a certain extent physiological in this tissue. Plasma cells, when abundant, are an aid in the diagnosis of inflammation; but they are not diagnostic of a specific type such as gonorrhœa, contrary to the statements of some writers. Definite collections of pus-cells or round cells, fibrin, necrotic areas, and granulation membrane are the more outspoken marks of inflammation. Tuberculous endometritis presents no feature differing from those of tuberculosis elsewhere.

Endometritis, then, shows only the same exudative, destructive, or reparative processes which are characteristic of inflammation in general; and it is only in the presence of these that the diagnosis of endometritis should be made. All the glandular variations and stromal changes formerly described as endometritis are now recognized as cyclic changes. Thus endometritis is practically always bacterial in origin—chiefly puerperal and gonorrhœal. The term interstitial is tautological and out of place. Endometritis is not usually diffuse, except in severe puerperal cases. In the common form, associated with inflammatory adnexal disease, generally gonorrhœal, there are areas without inflammatory reaction. The distinction between acute and chronic endometritis depends upon the different elements in the exudate and the effect of a chronic irritant upon the fixed elements of the tissue. The characteristic

cell of chronic inflammation is the lymphocyte, and the tissue reaction is scar formation, the production of fibroblasts and elastic fibrils. These distinctions are not marked in the endometrium. No practical advantage is gained by making the distinction, and it seems better to avoid controversy by not using the term chronic endometritis. [In simpler words, the endometrium is like a wall-paper which is constantly being shed and replaced by a new one during reproductive life ; thus it cannot be expected to show the tissue changes of chronic inflammation.—W. E. F.]

Dangers of Curettage.—W. A. Lincoln⁴ says that the most accepted rule of conduct is, "When in doubt, curette", more especially as the pathologist offered moral support in the shape of a beautiful classification of the uterine scrapings into glandular and interstitial endometritis, one of these or "a mixed condition" being practically always found. A nice symptomatology was built up around these, all the way from amenorrhœa, dysmenorrhœa, metrorrhagia, menorrhagia, or any other kind of a discharge, to general symptoms of lassitude, headache, backache, or any other ache. In case some women might be missed out, it was stated that it might be present without any symptoms whatever. Given a curette and a woman, the old-time gynecologist would always find endometritis.

In 1908 Alder and Hirschman demonstrated that what has been classified as endometritis was nothing more than stages in the usual menstrual cycle—premenstrual, glandular ; post-menstrual, interstitial. Cullen has shown that endometritis is really a very rare disease. It has also been shown that hæmorrhage is not a symptom of it. Furthermore, uterine bleeding is rarely cured by curetting. Busse collected 500 cases so treated, with improvement in only 10 per cent. Thus we have to forget all we were taught about endometritis, and start over again. In order to get direct information, Lincoln inquired of medical men in his own district, and from twenty-four of them he received details of 43 cases in which serious trouble had accompanied the use of the curette. There were 11 deaths amongst these 43 cases, which are all recorded. There were 5 cases of serious hæmorrhage, with 3 deaths ; 8 cases of sepsis, with 3 deaths ; 27 ruptures of the uterus, with 4 deaths ; and 3 cases in which the indication was pernicious vomiting of pregnancy, with 1 death. Thus a formidable list of accidents, with a high death-rate, is easily compiled. Any intra-uterine instrumentation is a dangerous procedure. The indications for curetting practically narrow down to the removal of some products of conception and of bits of tissue for microscopic examination. Curettage should only be undertaken under the best conditions, and by a careful and skilful surgeon.

REFERENCES.—¹*Surg. Gyn. and Obst.* 1919, July, 39 ; ²*Jour. Amer. Med. Assoc.* 1918, ii, 1101 ; ³*Amer. Jour. Obst.* 1919, Aug., 139 ; ⁴*Ann. Surg.* 1918, Dec., 638.

UVEAL TRACT, DISEASES OF.

R. Foster Moore, F.R.C.S.

Heterochromia.—J. Bistis¹ has endeavoured to show, by experiments on rabbits, that the well-known group of cases in which there is a combination of cataract, atrophy and bleaching of the iris, and keratitis punctata, is dependent upon changes in the sympathetic nerve. He removed the superior cervical ganglion on one side, and in one case found reduction of the pigment in the iris to follow. E. C. Ellett² also refers to the possible relationship to disease of the sympathetic. He states it usually occurs in brunettes, and before maturity.

Ernst Fuchs,³ in an important paper, describes the microscopical anatomy in two specimens. The first eye was removed for glaucoma six years after Fuchs had removed the cataract. The histological findings showed that the

pigmentation of the iris was that of a naturally unpigmented eye, and were directly opposed to the view that bleaching of the iris and the development of the cataract were secondary to an antecedent quiet form of cyclitis. In the second case Fuchs obtained the two eyes from a man dead of peritonitis, and so was able to compare the heterochromic with the normal eye, and in this as in the first case found support for the view already expressed. He describes with much care the type of inflammation which is associated with heterochromia. As practical points, one may note that there is no tendency towards the formation of posterior synechiæ or pupillary membranes; that although the inflammation lasts for years, it does not lead to deeper changes in the uveal tissue; and that the visual acuity is but little affected. Lental opacities do not occur in all cases, and in any case are not due to the moderate degree of uveal inflammation; they are perhaps due to some injurious effect of the heterochromia on the lens, or there may be some faulty development of the lens.

Sympathetic Ophthalmitis.—This remains a subject of much interest and importance, and has received careful investigation at the hands of van Schevensteen.⁴ He does not accept so-called sympathetic irritation as a first stage of the disease. The clinical course is noted. The period of incubation—i.e., the time between the wound of the one eye and the onset of ophthalmitis in the other—is given as between fifteen days and several years; it is clear, however, that the onset is rare after three months. Two types of the disease have been recognized for many years in which: (1) The anterior part of the uveal tract is specially involved; and (2) The posterior part; these two types receive recognition here. A considerable similarity exists between the histological characters of the changes in the uveal tract in this disease and in tuberculous disease. There is, however, no doubt as to the differentiation of the two conditions.

Arnold Knapp⁵ deals with the autotoxic factor in sympathetic ophthalmitis. Reference is made to the view held by some that this disease can only develop in those who already are out of health. The two forms of the disease are acknowledged—the mild 'serous' form, in which inflammation of the front parts of the eye is mild, fundus changes are visible, and recovery is usual; and the 'plastic' form, in which the anterior parts are seriously involved and the ultimate results are bad. Four cases are then reported, all of which ultimately recovered good vision. In three of these the pale choroidal spots which often occur in this disease were seen.

The autotoxic element in these cases was evidenced by a history of improper diet and over-eating, often associated with constipation. In two cases the stools were highly toxic, with large excess of indol and skatol. The usual treatment by mercury inunctions, pilocarpine sweats, and salicylates does not seem to have much effect. The author expresses some diffidence for suggesting autotoxæmia in these cases, but feels the high importance of investigating for a toxic factor in sympathetic ophthalmia.

W. G. Byers⁶ contributes a paper on the diagnosis of inflammations of the uveal tract of systemic origin. The paper is essentially a plea for extensive investigation as to the etiology of such cases, and it is made clear that this can only be carried out on the present-day idea of team work, for the points of inquiry detailed in the paper would alone represent many hours' work at the hands of many workers.

Siderosis Bulbi.—Ivor Ll. Tuckett⁷ reports a case of siderosis bulbi in which the pupil reactions were recovered after removal of the piece of iron; he deduces that the paralysis of the pupil is due to a selective action of the iron on the nerve endings.

Verhoeff⁸ shows that the dilator and constrictor muscles are densely packed with iron pigment in cases of siderosis, and to this he attributes the immobility of the iris.

REFERENCES.—¹*Arch. of Ophth.* 1915, July; ²*Trans. Amer. Ophth. Soc.* 1917, xv, 31; ³*Arch. f. Ophthal.* 1917, xciii, pt. 4; ⁴*Arch. Méd. Belges*, 1918, Dec., 621; ⁵*Jour. Amer. Med. Assoc.* 1919, i, 1897; ⁶*Canad. Med. Assoc. Jour.* 1918, viii, 593; ⁷*Brit. Jour. Ophth.* 1918, Feb.; ⁸*Ibid.* Nov., 571.

VACCINATION AND VACCINIA. (See SMALL-POX.)

VAGINA, DISORDERS OF.

W. E. Fothergill, M.D.

Vaginal Hernia (or Enterocoele).—H. B. Sweetser¹ records a case and discusses this rare condition. These herniæ have been mistaken for prolapse, for vaginal cyst, and for abscess. Several have been operated on under mistaken diagnosis, the gut being incised and even excised, with fatal results. It is therefore well to bear in mind that such cases occasionally occur. Operation is indicated on account of the danger of strangulation, the discomfort, and the possible interference with parturition. Some cases may be dealt with from below; in others it is necessary to open the abdomen to secure the best results.

As to the rarity of the condition, Barker, who recorded four cases in 1876, remarks that no case was mentioned in the first sixteen volumes of the *Transactions of the London Obstetrical Society*. Gaillard Thomas operated on a case by the abdominal route in 1885. In 1916 Hartman recorded a case which had been operated on several times for supposed prolapse (rectocoele). The sac lay behind the posterior vaginal wall. He excised it, operating by the vaginal route, and repaired the pelvic floor.

Hernia appearing in the vagina may find an exit in front of or behind the broad ligament. Those in front descend between the parametrium and the bladder and displace the anterior wall, usually at one side or the other. Those behind usually perforate some part of the levator ani or coccygeus muscles, or the interval between them, and push the anterior wall forward. They may appear laterally in the vaginal roof, or may extend low down in front of the perineum. [I have seen no case of anterior vaginal enterocoele, and only two of the posterior variety. These simulated rectocoele, but on passing a finger through the anal canal the presence of a hernial sac lying between the rectum and the vagina was recognized. *Colpo-perineorrhaphy* was done in each case, the hernial sac being excised as an extra stage introduced in the course of the operation. Recurrence has not been reported in either case.—W. E. F.]

Vesicovaginal Fistula.—In the MEDICAL ANNUAL, 1919 (p. 463), a paper by Reuben Peterson is abstracted wherein he records 41 cases in which the vagina was closed after making a rectovaginal fistula, the rectum subsequently serving as a urinary bladder. W. W. Keen² gives the history of a case in which he used this device. In the year 1872, the patient, then 35 years old, had typhoid fever. Sloughing of the vaginal walls occurred and left both vesicovaginal and rectovaginal fistulæ. After six attempts to close these fistulæ had failed, Keen closed the vaginal orifice in 1875, succeeding at the sixth attempt. She menstruated for eleven years through the rectum, and thereafter continued to micturate through the rectum until her death in 1911, thirty-five years after the closure of the vaginal outlet. In 1888 a calculus formed in the vagina; it was easily removed by crushing. She generally voided urine seven or eight times in the twenty-four hours. The rectum and its normal function remained healthy throughout.

C. M. Rosser³ describes a case in which he replaced the absent urethra by the appendix vermiformis of the patient with complete success. The urethra had been removed five years previously because it was said to be the seat of a

malignant growth. The patient had no control over the vesical orifice left by the operation. Rosser made incisions at the base of the clitoris and at the exit of the bladder, and made a tunnel from one to the other with a forceps. Mucosa was dissected from inside the neck of the bladder for $\frac{3}{4}$ in. The appendix was then removed, washed in warm saline, and sterilized by passing 50 per cent alcohol through it. The tip of the appendix was cut off, and several linear incisions were made through its peritoneal coat. It was then passed through the tunnel so that its distal end went $\frac{1}{2}$ in. into the raw neck of the bladder. The structures were secured in position with sutures of fine catgut. A catheter was worn for a few days. The patient subsequently had perfect control over micturition.

REFERENCES.—¹*Ann. Surg.* 1919, June, 609; ²*Ibid.* 606; ³*Ibid.* April, 435.

VARICELLA.

J. D. Rolleston, M.D.

SYMPTOMS.—The subject of *accidental rashes* in varicella, to which the reviewer drew attention some years ago (*see* MEDICAL ANNUAL, 1908, p. 613), is discussed by Comby,¹ who records 19 cases, in 18 of which the rash was scarlatiniform, and in 1 morbilliform. In one case the patient had two rashes in succession, the first pre-eruptive and scarlatiniform, and the second post-eruptive and morbilliform six days later. In 9 cases the rash preceded the eruption of varicella, or occurred at the onset, and in 3 it appeared at the end of the disease. The rash is probably an infective or toxi-infective erythema, and though of considerable diagnostic interest has no prognostic significance.

R. Cranston Low² records three cases in which *herpes zoster* in one individual was followed by varicella in another within the ordinary incubation period for chicken-pox, and agrees with Le Feuvre (*see* MEDICAL ANNUAL, 1919, p. 464) that the two diseases are probably due to the same virus.

C. C. Jones³ reports a case of *fatal epistaxis* following varicella. The patient, a coloured man aged 25, began to have slight epistaxis daily fifteen days after a normal attack of epistaxis. Four days later he had severe pain in the left ear, which was followed in a few hours by a profuse bloody discharge. The epistaxis subsequently became very profuse, and death took place fourteen days after the onset in spite of packing the nostrils, adrenalin spray, and thromboplastin locally. The autopsy showed mastoid and ethmoid infection, which was secondary to the hæmorrhagic condition, and had no bearing on it, except possibly to aggravate it.

TREATMENT.—To prevent itching and subsequent scarring due to secondary infection, C. Corben⁴ recommends painting each vesicle twice, or at least once daily, with **Tincture of Iodine**.

REFERENCES.—¹*Arch. de Méd. des Enf.* 1919, 57; ²*Brit. Med. Jour.* 1919, i, 91; ³*Laryngoscope*, 1919, 101; ⁴*Brit. Med. Jour.* 1919, ii, 135.

VARIOLA. (*See* SMALL-POX.)

VASCULAR SYSTEM, SURGERY OF. Sir W. I. de C. Wheeler, F.R.C.S.I.

The injuries to blood-vessels caused by overstretching and superficial contusions have been neglected in surgical literature. The late J. B. Murphy, however, repeatedly drew attention to the danger in elderly people of producing traumatic obliterative endarteritis, with consequent gangrene, in operations designed to correct old-standing flexions of the hip, knee, and elbow. William Anderson¹ draws attention to contusion of arteries as the probable cause of secondary hæmorrhage or aneurysm. He found during the war that severe secondary hæmorrhage occurred in some cases where the vein alone had been divided and the artery was supposed to be intact. In one case in which he deliberately opened the artery for investigation, there was a rupture of the

internal and middle coats: the sheath enclosing the artery and vein showed but slight bruising, and the injury to the artery was found after opening up this sheath (Figs. 49, 50).

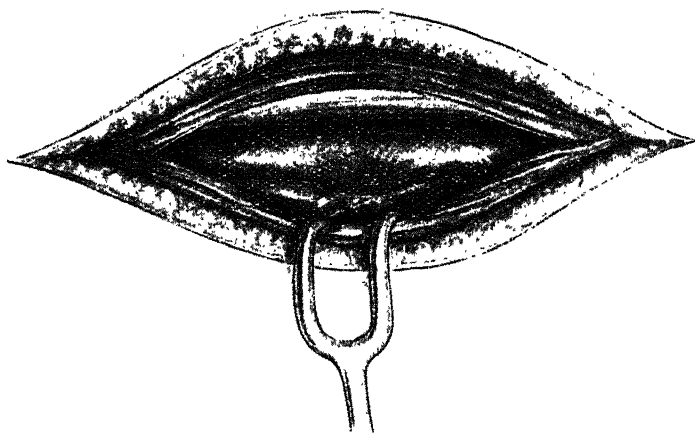


Fig. 49.—External appearance of injured artery, showing bruising and bulging of the wall.

DIAGNOSIS.—Some of the cases of contusion of an artery can be diagnosed at once before such sequelæ as secondary hæmorrhage, traumatic aneurysm, dry gangrene, or embolism following thrombosis, develop. The site of the wound, the diminution or absence of a distal pulse, and the appearance of bruising of the wall or sheath of the vessel, should arouse suspicion and call for a close examination. A peculiar 'hard' feeling of the muscles of the limb distal to the injury is found only when the lumen of the vessel is completely occluded. In a few of the cases there were well-marked local and general signs of hæmorrhage, but this was always due to penetration or division of the accompanying vein, or of a branch of the artery, and not to leakage from the vessel itself.

TREATMENT.—Very thorough opening up and cleaning of the wound is here, as in all blood-vessel injuries, a *sine qua non* to success. Anderson says: "At first, as I expected to find only a thrombus, I opened the artery with the intention of removing the clot and re-establishing the circulation by suture of the vessel. Although I felt sure that the vessel would become occluded in a few days, I hoped that this would be gradual and allow for the establishment of collateral circulation, thereby diminishing the risk of ordinary gangrene or gas gangrene in the limb.

"I gave up this procedure for the following reasons: (1) There is no clot at



Fig. 50.—Internal appearance of injured vessel, showing exposed tunica adventitia and the curled-up edges of tunica media and intima.

this stage. (2) It is impossible to suture or to trim satisfactorily the edges of the torn tunica. (3) Suture of the tunica adventitia alone is difficult and unsatisfactory. (4) One narrows the lumen of the vessel, and increases rather than lessens the chances of rapid clotting.

"If there is even the faintest pulsation below the injury, it is better, I think, to leave well alone in all cases, and to tie the vessel above and below the injury on the fourth to the sixth day. On account of the great risk of gangrene where there is obviously no circulation through such arteries as the common femoral, popliteal, posterior tibial, or axillary, use should be made of Tuffier's tubes, or, as suggested by Sencert, of venous grafts, to re-establish the circulation, at least temporarily. I must confess that my experience of these methods of re-establishing the circulation has not been particularly happy; yet the results of immediate ligation are so bad as to justify their continued trial.

"In the smaller vessels, primary ligation above and below the injury might be done, but I think it better to postpone this for four to six days—when delayed primary suture of the wound may be undertaken at the same time—in the hope that some blood may be getting through which will help to fight our persistent enemy, sepsis. After four to six days, the risk of gangrene is much less, and secondary hæmorrhage is unlikely to occur before this date.

"In conclusion, I would emphasize again the importance of the recognition and treatment of this type of injury as a preventive of secondary hæmorrhage, and would suggest that those traumatic arterial aneurysms which appear some little time after the man is wounded may in many cases owe their origin to a contusion of the arterial wall."

Aneurysm of the Heart.—Curfman and Fuller² describe a case of aneurysm of the right ventricle following trauma. The patient was injured in the epigastrium by a kick from a mule, following which there were difficulty in breathing, persistent cough, and expectoration of blood-stained mucus. The lips and tongue and face generally were cyanotic; the cardiac impulse was heaving in character, and extended $1\frac{1}{2}$ inches to the left of the nipple line. There was a loud systolic murmur, most audible at the apex, and transmitted over the entire cardiac area. Ascites was present, and the liver extended three finger-breadths below the left costal margin. The lower extremities were swollen and œdematous. The patient died seven months after the accident. On opening the chest wall the pericardial sac was found to be filled with about 1 litre of light, amber-coloured fluid. The pericardium was greatly thickened. The lungs were normal. The heart was enlarged and weighed 723 grms. The circumference at the base of the ventricles was $13\frac{1}{2}$ in. The length of the right ventricle was 7 in. and of the left ventricle 5 in. At the apex of the right ventricle was found an irregular tumour about the size of a half lemon (*Fig. 51, A*), which proved to be a sacculated aneurysm of the right ventricle, connected with the right ventricle by an opening large enough to admit the index finger. The right ventricle was greatly hypertrophied, with a relative insufficiency of the tricuspid valve. The abdomen was normal except for a large amount of ascitic fluid.



Fig. 51.—Anterior view of right ventricle showing aneurysm (A).

REFERENCES.—¹*Brit. Jour. Surg.* 1919, July, 95; ²*Jour. Amer. Med. Assoc.* 1919, June 7, 1673.

VENEREAL DISEASE. (See GONORRHEA ; SYPHILIS ; PUBLIC HEALTH ADMINISTRATION.)

The use of Xylol in prophylaxis, p. 13.

VESTIBULAR EXAMINATION IN RELATION TO NEUROLOGY.

John S. Fraser, M.B., F.R.C.S.

Isaac H. Jones¹ states that there are many cases in which the neurologist, without the aid of ear, eye, blood, or other examinations, finds no difficulty in arriving at a satisfactory diagnosis. Examination of the vestibular apparatus merely gives additional information, by a series of refined experiments, to that obtained by the other methods at the command of the neurologist. In obscure cases the ear tests may furnish information upon which a diagnosis can be made. (See MEDICAL ANNUAL, 1918, p. 591.)

According to Langdon, Maxwell, and Jones² (1) The fibres from the horizontal semicircular canal pass through the eighth nerve, enter the brain stem at the junction of the medulla and pons, continue directly to Deiters' nucleus, and there divide into two pathways: (a) *The vestibulo-ocular tracts*, concerned in the production of nystagmus. These go from Deiters' nucleus to the posterior longitudinal bundle, through which they pass to the various eye-muscle nuclei, from which, through the third and sixth nerves, they are distributed to the eye muscles themselves. (b) *The vestibulo-cerebello-cerebral tracts*, responsible for the vertigo. From Deiters' nucleus this path enters the cerebellum, through the *inferior* cerebellar peduncle, to the three vestibular cerebellar nuclei (N. fastigii, emboliformis, and globosus) of the same side, from which it proceeds upwards through the superior cerebellar peduncle and continues to the cerebral cortex on both sides, but more particularly to the opposite side, through the crura cerebri. The cortical areas which receive these fibres are postulated by Mills to be the posterior portion of the second temporal convolutions adjacent to the cortical areas for hearing. (2) The fibres from the vertical semicircular canals pass through the eighth nerve, immediately ascend into the pons, and, at a point above its middle, divide into two pathways, similar to those of the horizontal canals at Deiters' nucleus. (a) *The vestibulo-ocular tract*, the fibres entering the post-longitudinal bundle to be distributed to the eye muscles. (b) *The vestibulo-cerebello-cerebral tract*, which reaches the cerebellum through the *middle* cerebellar peduncle, entering the cerebellar nuclei of the same side; from this point the pathway is identical with that of the fibres from the horizontal canal, through the superior cerebellar peduncle to the cerebral cortex of both sides.

According to Jones,¹ nystagmus and vertigo, with loss of equilibrium, associated perhaps with nausea and vomiting, may be produced either by (1) a disturbance of the internal ear, or (2) by an intracranial lesion.

1. A *peripheral* lesion (labyrinth or eighth nerve) is suggested by the following: (a) An impairment of the function of both the cochlear and kinetic-static labyrinth. (b) The history or presence of tinnitus; the absence of tinnitus, however, does not necessarily indicate that the end-organ is not involved. (c) Proportionate impairment of the responses from the horizontal canal and vertical canals. (d) Proportionate impairment of both nystagmus and vertigo.

1. A *central* lesion is suggested by the following: (a) A normal cochlea, but impaired or non-responsive semicircular canals. (b) Normal responses from the horizontal canal, but absent from the vertical canals. (c) Normal responses from the vertical canals, but impaired from the horizontal canal. (d) Normal vertigo but impaired nystagmus from the horizontal canal (respectively the vertical canal). (e) Normal nystagmus but impaired vertigo from the horizontal canal (respectively the vertical canal). (f) Normal vertigo and

normal nystagmus from any semicircular canal, but impaired past-pointing in any direction of any one extremity. (g) Normal vertigo and normal nystagmus from any semicircular canal, but an impairment or absence of the normal falling reaction. (h) Spontaneous vertical nystagmus is pathognomonic of a central lesion, and is indicative of involvement of the brain-stem, caused either by its infiltration or pressure. An ear lesion can never produce a spontaneous vertical nystagmus, either upward or downward. (i) If there exist a spontaneous nystagmus to the right and non-responsive semicircular canals of the right ear, an intracranial lesion is suggested. If the labyrinth itself alone were responsible, nystagmus to the left would result. (j) A spontaneous nystagmus of increasing intensity or of long duration (more than ten days) is indicative of a central lesion. (k) If stimulation of any semicircular canal produces a 'perverted' or 'inverse' nystagmus, it is pathognomonic of a central lesion and is indicative of brain-stem involvement. Douching the right ear with cold water with the head back 60° stimulates the right horizontal canal and should produce a pure horizontal nystagmus to the left. If we get a vertical nystagmus, a rotary, oblique, or mixed nystagmus, it may be spoken of as 'perverted'. If, instead of a horizontal nystagmus to the left, there is produced a pure horizontal nystagmus to the right, it may be termed an 'inverse' nystagmus. Neither a perverted nor an inverse nystagmus can possibly be produced by a lesion of the labyrinth or eighth nerve. (l) If ear stimulation produces a conjugate deviation of the eyes instead of a nystagmus, it is pathognomonic of a central lesion. If stimulation of the horizontal canal fails to produce both nystagmus and vertigo, the lesion indicated is at a point before the division of the horizontal canal fibres into their two separate pathways. Further, if the horizontal canal produces normal vertigo but no nystagmus, the lesion indicated is in the vestibulo-ocular tract at a point beyond the point of division into the two paths. If the horizontal canal produces normal nystagmus but no vertigo, the lesion indicated is at a point along the vestibulo-cerebello-cerebral path beyond the point of division into the two pathways. Similarly with the vertical canals. The ear tests have proved themselves surprisingly helpful in locating lesions in the cerebello-pontine angle, medulla oblongata, pons, cerebellar peduncles, cerebellum, and various portions of the cerebrum, including the parietal lobe, the temporal lobe, and the occipital lobe. In order to obtain reliable data from an ear examination, it is essential that the technique should be accurate and painstaking.

Lewis Fisher³ states that the first question in any given case is, Are we dealing with a functional or an organic condition? If all responses to ear stimulation are perfectly normal, a functional condition may be suspected. A definite impairment of even one response shows that we are dealing with an organic lesion. Our next problem is to determine whether the case is one of peripheral or central lesion. Many cases of cerebellar lesion or tumours of the cerebellopontile angle present symptoms similar to those observed in an affection of the labyrinth, and vice versa. In a peripheral lesion *all* the responses are impaired, and conversely the presence of any *one* normal response to stimulation indicates a normal labyrinth and eighth nerve. If the findings lead to the conclusion that the lesion is central, the simplest method of procedure is that of elimination. We begin with the labyrinth and proceed brainward, considering each structure by itself: (1) With good hearing and one or more normal responses from the static-kinetic portion of the labyrinth, the labyrinth itself and eighth nerve are to be considered uninvolved. (2) For information relative to the condition of the medulla oblongata and inferior cerebellar peduncles, we examine the responses obtained on stimulation of each

horizontal canal *separately*. This test is performed by tilting the head back 60° after douching. If this produces normal horizontal nystagmus and vertigo with past-pointing and falling, the medulla oblongata and inferior cerebellar peduncle of that side may be considered uninvolved. (3) To determine the integrity of the pons, we examine the responses obtained from stimulating the vertical semicircular canals. These are tested when the ear is douched with the head 30° forward—the so-called ‘upright’ position. If a normal rotary nystagmus is produced, with vertigo, past-pointing, and falling, it suggests uninvolved pathways in the pons and middle cerebellar peduncle of the side douched. (4) The cerebellum is considered as not the seat of any gross lesion if stimulation of either ear or any canal produces past-pointing of both arms in both directions. (5) When the tests of *all* the semicircular canals of both ears produce impaired or absent vertigo, it is reasonable to suppose that there is *one* lesion located at a point where *all* the fibres concerned in vestibular vertigo come together, i.e., the decussation of the superior cerebellar peduncles. (6) With no responses at all from the right ear, and an absence of response from the vertical canals of the left ear, it is reasonable to explain the whole ‘phenomenon-complex’ by one lesion in the right cerebellopontile angle, where an involvement of the right eighth nerve would produce no response from the right labyrinth, and by pressure against the brain-stem would interfere with the responses from the vertical canals of the opposite side.

Fisher gives the following examples: (a) If stimulation of the right ear produces no nystagmus, vertigo, past-pointing, or falling, there is obviously a destruction of the labyrinth or eighth nerve. We should of course have complete deafness of this ear. (b) When stimulation of the right horizontal canal produces: nystagmus, none; vertigo, normal; past-pointing, normal; falling, normal; it suggests a lesion in the medulla oblongata between Deiters’ nucleus and the posterior longitudinal bundle on the right side. (c) When stimulation of the right horizontal canal produces: nystagmus, normal; vertigo, none; past-pointing, none; falling, none; it suggests a lesion of the right inferior cerebellar peduncle. (d) When stimulation of the right vertical canal produces: nystagmus, none; vertigo, normal; past-pointing, normal; falling, normal; it suggests a lesion in the posterior portion of the pons near the posterior longitudinal bundle on the right side. (e) When stimulation of the right vertical canals produces: nystagmus, normal; vertigo, none; past-pointing, none; falling, none; it suggests a lesion of the right cerebellar peduncle. (f) When stimulation of *all* canals of *both* ears produces: nystagmus, none; vertigo, normal; past-pointing, normal; falling, normal; it suggests a lesion of the posterior longitudinal bundles themselves. (g) When stimulation of *all* canals on the right side produces: nystagmus, normal; vertigo, none; past-pointing, none; falling, none; it suggests a lesion of the cerebellar vestibular nuclei of the right side. (h) When stimulation of *all* the semicircular canals of *both* ears produces: nystagmus, normal; vertigo, none; past-pointing, none; falling, none; it suggests a lesion at the base of the cerebral crura at the point of decussation of the two superior cerebellar peduncles. (i) When the right ear is totally deaf, and stimulation of its semicircular canals produces: nystagmus, none; vertigo, none; past-pointing, none; falling, none; and stimulation of the left horizontal semicircular canal produces the only normal reactions on that side, the lesion is located in the right cerebellopontile angle. Fisher admits, however, that when confronted with actual pathological cases of intracranial involvement, the findings may be obscured by pressure phenomena.

Dench, in discussing a case recorded by Friesner,¹ remarked that, whenever we get a paradoxical reaction from the labyrinth, we can either put the lesion

in the trunk of the nerve or in the central nerve system, rather than in the end-organ. There are, however, a great many variations which come within the normal standard, as far as time reaction is concerned. One cannot say that a patient rotated in a certain direction must give nystagmus for a certain number of seconds. He will give it approximately, but one cannot draw the line hard and fast. One can say, however, that if a man persistently over-points spontaneously, he has something the matter with his brain. If a man does not over-point as the result of stimulation of his vestibular labyrinth, with normal hearing, he has something the matter in his brain. If with normal hearing he has not normal nystagmus as a result of rotation, he has something the matter in the central nervous system. When, however, it comes to the exact location of the lesion, we have yet much to learn.

In reply to Dench, Friesner said that we must remember that we are dealing with a reflex, at least as far as the nystagmus is concerned. No neurologist would state that, as the result of a tap of a certain strength on the quadriceps extensor tendon, there must follow a kick of an exact amplitude, and that, if this did not occur, therefore that reflex pathway is blocked.

Ernest Sachs⁵ sounds a note of warning regarding the reliability of the results claimed from examination of the vestibular apparatus. The neurologist claims that by his tests he can place a lesion in these tracts. A number of cases which Sachs has seen show the danger of such a conclusion, for in these cases the mechanism controlling the vertical canals did not react, while that of the horizontal canals was functioning normally. Consequently it seemed probable that there was a lesion in the pons. Subsequent operation showed that these cases all had an internal hydrocephalus, and that the dilatation of the ventricles had pressed on the pathways passing from the pons and thus had caused this symptom. This might be interpreted as proof that the pathway of the vertical canals lies in the pons. It shows unquestionably, however, that a diffuse process like a hydrocephalus can give focal Bárány tests. Sachs holds that the neuro-otologists have gone so far ahead of the anatomists and physiologists that they are in the same position as infantry unsupported by heavy artillery. If all other findings are negative, Sachs is never willing to subject a patient to operation when only the Bárány method of examination gives abnormal results.

REFERENCES.—¹*Ann. Otol.* 1918, Sept., 881; ²*Arch. Ophthalm.*, N.Y., 1918, xlvii, 348; ³*Laryngoscope*, 1918, Oct., 724; ⁴*Ann. Otol.* 1918, Dec., 1300; ⁵*Ibid.* 1919, March, 76.

VINCENT'S DISEASE.

P. Watson-Williams, M.D.

A. J. Wright, M.B., F.R.C.S.

This condition, rare in peace time, was relatively frequent in soldiers at the front. Tixier and Tobe¹ regard this frequency as the result of defective local and general hygiene inseparable from warfare. All forms of stomatitis were observed, with diffuse or localized lesions. The teeth, as a rule, were in bad condition, with accumulation of tartar. Complications observed were cutaneous, glandular, and visceral. (1) Cutaneous: the eruption resembled measles, scarlet fever, chicken-pox, erythema multiforme, or erythema bull-
osum. (2) Glandular: involvement of the submaxillary, cervical, axillary, and inguinal lymphatic glands was common. (3) Visceral complications were found in severe cases of stomatitis, especially in those accompanied by erythema bullosum. They consisted of albuminuria, pericarditis, inflammation of the serous membranes, joints, and meninges, and pulmonary complications ranging from bronchitis to bronchopneumonia. In a few, blood cultures have given positive results in the form of fusiform bacilli, and spirilla have occasionally been found in the urine.

TREATMENT.—Energetic local application of 1 per cent solution of **Methylene Blue**, **Silver Nitrate**, or 1–30 emulsion of **Neosalvarsan** in glycerin gave the best results. Intravenous injections of neosalvarsan were valuable in cases with complications.

REFERENCE.—¹*Progrès Méd.* 1918, 245.

VISCEROPTOSIS.

A. J. Walton, M.S., F.R.C.S., B.Sc.

Of late years it has been realized that many cases are operated upon in the expectation that a chronic gastric or duodenal ulcer, cholelithiasis, or chronic appendicitis is present, but no such lesion is found. These cases, which are much more common in females, have been from time to time entitled 'abdominal neurosis', 'the chronic abdomen', or 'intestinal stasis.' The work of many investigators has little by little made it clear that they all have a common pathology. Glénard¹⁹ showed that many cases of visceroptosis presented abdominal symptoms. Wilms²⁰ has described a dilated and mobile cæcum, Jackson²⁵ a membranous sheet in the region of the cæcum, and Payr²¹ a somewhat similar membrane around the splenic flexure. Sir Arbuthnot Lane^{22, 23} directed attention to various kinks and bands, the best known of which, perhaps, is that close to the ileocaecal valve.

Extensive recent investigations show that there are three factors: (1) General ptosis; (2) Membrane and band formation; (3) General skeletal and muscular changes. These three factors occur together, but there is much discussion as to which is the primary lesion.

PATHOLOGICAL CHANGES.

The investigations of Rovsing⁴⁵ and Duret,¹² which have been confirmed by the work of Jordan²⁶ and Hurst,²² show that the stomach is prolapsed, chiefly along the line of the lesser curvature, so that it becomes U-shaped, with a sharp kink at its middle. The greater curvature may be in the pelvic cavity. It is not only prolapsed, but also dilated, although there are spasmodic and irregular contractions. The duodenum is abnormally mobile, so that the first, and even the second, parts may be capable of being withdrawn from the abdominal cavity. Kellogg²⁷ has pointed out that it is dilated as well as mobile. Jordan²⁶ has demonstrated a delay in the passage of its contents, although Hurst²³ denies that gastric and duodenal stasis is ever secondary to intestinal stasis. The whole of the colon is lengthened and dilated, the cæcum often forming a large pouch which may even pass down into the pelvis. It is freely mobile, and can readily be withdrawn through the abdominal incision. The same is true of the ascending colon. The transverse colon forms a greatly lengthened loop which may hang down as far as the pelvic cavity, and the loop of the pelvic colon may be greatly lengthened and dilated. The solid viscera are also more mobile than normal. The liver tends to prolapse, and, as it does so, rotates to the right, so that the right lobe may project below the costal margin; the projecting portion in advanced cases is separated by a constriction from the rest of the liver, so that it comes to form what is known as Riedel's lobe. Both kidneys, and more especially the right, are mobile, and in some cases can be pushed down to the iliac fossæ. The uterus is prolapsed and retroverted (*Plate XXXVIII*).

Passing from the under surface of the gall-bladder to the pylorus and the duodenum is a thin membranous band which is directly continuous with the gastrohepatic omentum. This band is known as the 'cysticoduodenal fold'. Passing from the under surface of the mesocolon to the first part of the jejunum immediately beyond the duodenojejunal flexure is a second membranous band,

which Pringle⁴³ designates the 'mesocolic band'. On the under surface of the mesentery of the small intestine, and 2 to 3 inches from the ileocaecal valve, may be found a band which causes the so-called 'Lane's kink'. This band is fibrous in structure, and is placed at right angles to the long axis of the gut. It may be limited to the mesentery, or in well-marked cases may extend from the right iliac fossa to the antimesenteric border of the small intestine. It binds down the intestine, and by kinking or rotating it causes obstruction. It is not in the substance of the mesentery, but superimposed on its under surface, so that when it is divided the intestine can be restored to its normal position. Passing from the right parietal wall to the anterior surface of the ascending colon and caecum is a delicate membranous sheet known as 'Jackson's membrane'. It is transparent, and contains long parallel blood-vessels. It is freely movable on the surface of the colon, but forms a bag which appears too short to contain the colon, so that this structure is kinked. Above, it may pass to the liver and form a hepatocolic ligament. At the splenic flexure a somewhat similar membrane known as 'Payr's membrane' may be seen passing from the termination of the transverse to the commencement of the descending colon, and fixing this structure to the hilum of the spleen. The outer surface of the mesentery of the pelvic colon is bound down to the left iliac fossa with a well-defined fibrous band running parallel with the long axis of the gut. This is also quite distinct from the mesentery, so that when it is divided the pelvic colon can be restored to its normal position (*Plate XXXIX*).

Rovsing⁴⁵ believes that the condition of the stomach described above may be followed by ulceration at the points of kinking, namely at the lesser curve and at the pylorus, and that this leads to hour-glass constriction. This will account for the fact that hour-glass constriction is much more common in women, and is often associated with pyloric obstruction. Lane²³ and Jordan²⁸ believe that ptosis is frequently associated with, and is indeed a direct cause of, the common form of ulceration. This I have not found to be the case, for whereas ptosis is very common in women and rare in men, the reverse is true of chronic gastric and duodenal ulcers. Of a total of 273 cases of gastric and duodenal ulcer in my own practice, 217 showed no evidence of ptosis; 47 cases showed some evidence of ptosis, but gave no symptoms, and were completely cured by treatment directed to the ulcer; and only 9 showed both conditions, each of which gave rise to symptoms.

The researches of Smith,⁴⁷ Goldthwait,²⁰ and Rovsing⁴⁵ have shown that there are two varieties of skeletal change, which they designate respectively the virginal and maternal types (*Plates XL, XLI*). The former patients are thin and poorly developed, and in childhood are often taller than normal. The thorax is narrow, shallow from before backwards, and shows a narrow epigastric angle. The upper abdomen is narrow, and the waist long; the shoulders are round, and the lumbar curve is diminished. There are signs of general muscular weakness. In this type there may be an hereditary influence, but in the majority the condition is acquired in childhood. It must be remembered, however, that of the many people showing these skeletal changes only a relatively small proportion have abdominal symptoms. The changes are together usually spoken of as the 'ptosis habitus'. In the maternal type there is no alteration in the skeleton. The patient is well-built, with a capacious thorax, and a relatively wide upper abdomen. The abdominal muscles are, however, atrophied, so that the lower abdomen is distended; the lumbar curve is lost, and the shoulders are round. There is often marked loss of weight. In this variety, as in the former, only a certain proportion of the patients showing the pathological changes suffer any inconvenience.

PLATE XXXVIII.

VISCEROPTOSIS

(A. J. WALTON)

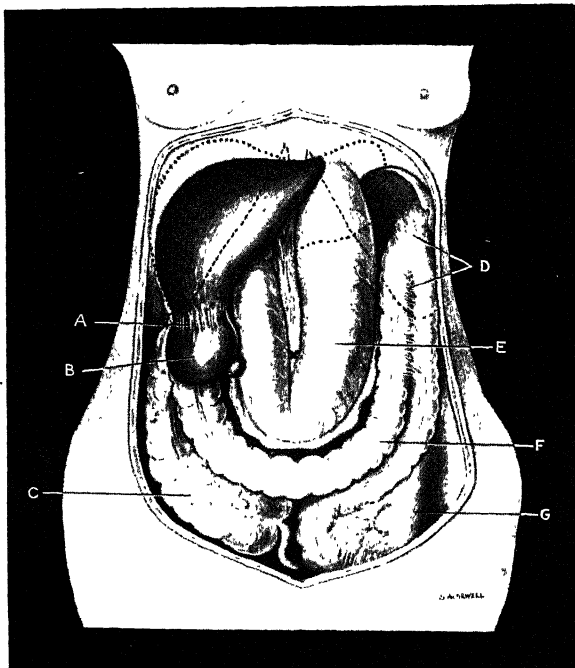


Diagram showing marked ptosis of the viscera. The normal position of the liver and the costal margin is shown in dotted lines. (A) Constriction groove on liver; (B) Riedel's lobe of liver; (C) Ptois of cæcum; (D) Payr's membrane; (E) Ptois of stomach. immediately behind this organ appears the cut edge of the great omentum; (F) Ptois of colon. (G) Perisigmoid band.

PLATE XXXIX.

VISCEROPTOSIS—continued

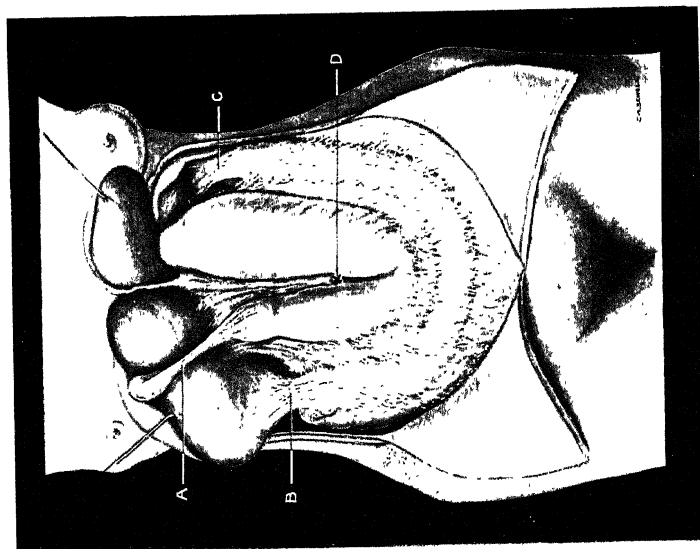


Fig. 1.—Diagram of parts with the viscera *in situ*. (A) Cystocolic fold; (B) Hepatocolic ligament; (C) Falciform membrane; (D) Position of umbilicus.

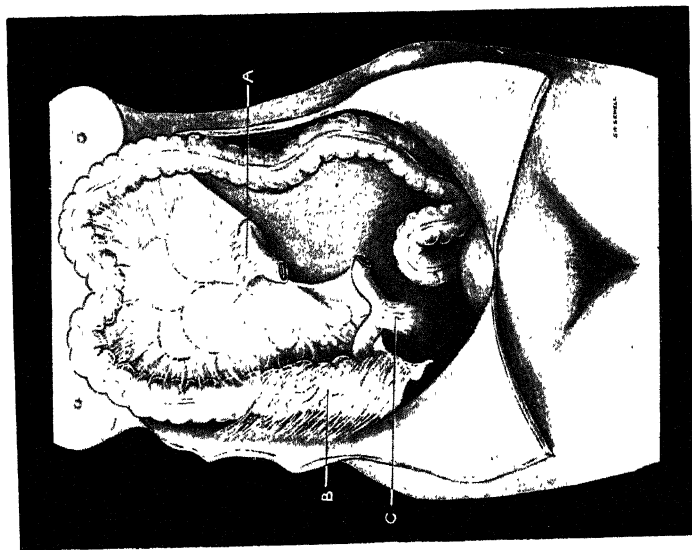


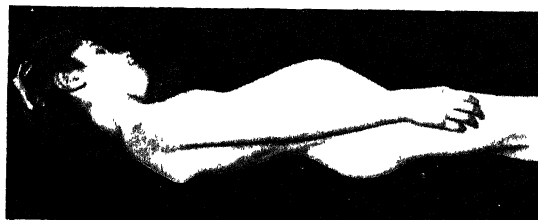
Fig. 2.—Diagram showing accessory membranes. (A) Me-cocolic band; (B) Jack-on's membrane; (C) Lane's membrane and dead limb.

PLATE XL.

VISCEROPTOSIS—continued

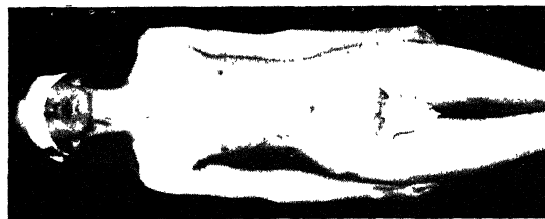


A.



B.

Figs. A, B.—Visceral ptosis in a child, showing the scooping shoulder, prominent scapula and abdomen, and the narrow lower thorax.



C.

Figs. C, D.—Visceral ptosis in an adult, age 29. Note the long narrow thorax and abdomen and the narrow subcostal angle. Extreme ptosis found by x-ray examination and operation.



D.

Figs. D, E.—Side view of same case. Note the absent lumbar curve, the shallow thorax, and the curved shoulder.

PLATE XLI.

VISCEROPTOSIS—continued

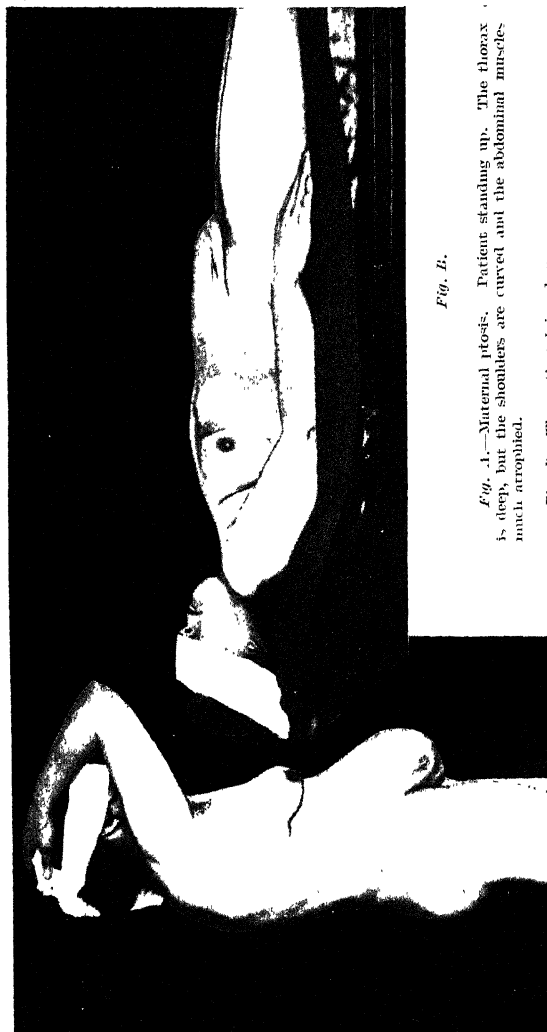


Fig. A.

Fig. A.—Visceral ptosis. Patient standing up. The thorax is deep, but the shoulders are curved and the abdominal muscles much atrophied.

Fig. B.—The patient lying down.

Fig. B.

ETIOLOGY.

The three following facts are recognized: (1) The condition is much more common in women; my own figures show that of a total number of 165 cases, 130 were women, and 35 men. (2) At operation there is always some evidence of membrane formation; but a similar membrane formation may be found at an operation for some other lesion, and may never have given rise to any symptoms. (3) There is always some evidence of ptosis, either at operation or by x-ray examination; but here again there are a large number of patients with definite ptosis who have no symptoms. It is evident, therefore, that both ptosis and membrane formation must be present to produce symptoms.

Formation of the Bands and Membranes.—The following theories have been put forward to account for the formation of membranes:—

1. *That they are the result of chronic intestinal stasis.* This is the view which has been put forward by Sir A. Lane.^{29,30} He believes that there is primary stasis and ptosis due to the erect posture, aided perhaps by faulty habits in childhood, and by the wearing of corsets and frequent pregnancies. The dilated intestine constantly pulls upon its mesenteric points of attachment, and at these points there is a tissue reaction leading to the formation of bands and adhesions, which tend to prevent the increase of the ptosis. They are so irregularly formed, however, that their presence kinks the gut and increases the obstruction. He believes that the first band to be so formed is that situated at the pelvic colon, and as the distention passes upwards, the bands and membranes are formed at higher and higher levels. The stasis is thereby increased, and gives rise to the formation of local lesions, such as gastric and duodenal ulcer, and to changes dependent upon toxic absorption, such as chronic mastitis and rheumatoid arthritis. The toxic absorption also lowers the patients' resistance, so that they are more prone to be infected with tuberculosis.

These views, although meriting careful attention, cannot be regarded as proved. Clinical evidence does not support the view that gastric and duodenal ulcers are caused by stasis, and Adami³ has shown that it is unlikely that tuberculosis is dependent upon intestinal stasis. It is improbable that this is the true method of the formation of the membrane, for, as Gray and Anderson²¹ point out, there is never membrane formation in the upper layers of the mesentery; and the Jackson's membrane does not limit the mobility of the cæcum—in fact, the more mobile the cæcum, the better developed the membrane. Recent anatomical investigations show also that the membranes are frequently present at birth, and in the six-months fœtus.

2. *That they are dependent upon chronic inflammatory changes.* Jackson in his original description put forward the view that the membranes about the cæcum and ascending colon were inflammatory in origin, a view which was later supported by Binnie,⁴ Gerster,¹⁸ and others. Of late it has to a large extent fallen into disrepute, owing to the fact that the membranes may be found in fetal life. The thin membranes found in this condition also do not resemble the fibrous structures that are found with inflammatory changes. If they were inflammatory, they would be found along the mesenteric vessels rather than on the outer side of the cæcum as is seen with the Jackson's membrane.

3. *That the membranes and bands are congenital.* In the early days of our knowledge of this subject it began to be apparent that the membranes were not infrequently found in young children. The work of Eastman¹³ and Flint¹⁷ shows that they may also be present in the fœtus; and later researches of Connell,¹⁰ Gray and Anderson,²¹ Pringle,⁴³ and Reid⁴⁴ make it clear that they

are not only congenital, but are due to excess of physiological fusion. The Jackson's membrane may often be found continuous with the right edge of the great omentum; the cysticocolic membrane is likewise continuous with the gastro-hepatic omentum; while the Lane's kink is a partial persistence of the genito-mesenteric fold of Reid. They are very frequently present, the Lane's kink being found in 10 per cent of all cases, and the membranes on the outer side of the mesentery of the pelvic colon being so common as to be almost the normal condition.

The Relation of the Ptosis to the Membranes.—Two opposing views have been held regarding this relationship:—

1. *That the ptosis is the primary factor.* It has already been mentioned that Sir A. Lane supports this theory. Coffey⁹ holds a somewhat similar view, but regards the ptosis as largely congenital, and not dependent upon the stasis. He points out that normally there are four supports to the viscera: (a) A shelf caused by the curve of the lumbar vertebræ, and the psoas muscles; (b) The abdominal muscles, which hold the structures on the shelf; (c) The mesenteric attachments; (d) The extraperitoneal fat. If there is a congenitally incorrect body formation, so that the lumbar curve is abolished, and the abdominal muscles are poor, there will be nothing to overcome the tendency to ptosis, which is caused by the abnormally long mesenteries. This is somewhat similar to Stiller's original view that the condition is due to a congenital universal asthenia. This view cannot be accepted; for not only are the membranes present before a ptosis can have arisen, but, as Rovsing⁴⁵ and Bissell⁵ point out, if it were correct the condition would be equally common among men and women, whereas, it is nearly five times as common in females.

2. *That the membranes are the cause of the ptosis.* Gray and Anderson believe that the membranes are primary and the visceroptosis is secondary. According to this view the individuals are congenitally unfit owing to the presence of the membranes. The fact, however, that of a very large number of people in whom these membranes are present, only a small proportion show symptoms, makes it evident that this cannot be the whole explanation. This difficulty has been recognized by Eisendrath and Schnoor,¹⁴ who state that there are two types of membranes, both of which are congenital. One gives rise to no symptoms, but the other causes intestinal kinking and obstruction. It is not clear to them what causes this change, nor do they explain how the difference can be recognized. Gray believes that the obstruction is due to the manner in which the membranes are attached. He says that the bands are more common with certain types of ill-developed patients, and since these patients are also more likely to have ptosis, so the condition is found in the enteroptotic type of woman. He is unable to offer an explanation as to why these individuals are so frequently found in occupations which are most unsuitable to them.

The evidence at our disposal would suggest that the following is the correct sequence of events. The membranes and bands are merely a variation in the normal development, and under ordinary circumstances give rise to no symptoms. They are thus frequently found in normal people. Under the conditions of modern life an increasing number of patients are found with ptosis. Rarely this may be due to a congenitally bad body-formation, but in the majority it is acquired. In the latter case it is dependent upon one of two causes: (1) The first, which is much the more common, owes its inception to a combination of underfeeding and unhealthy surroundings in childhood. This factor in itself is probably insufficient, but when combined with lack of exercise and faulty habits, the 'ptosis habitus' will rapidly develop. It is for this reason much more common in girls. Boys, even among the poorer classes,

have a greater amount of exercise, and in nearly all cases have a certain amount of drill while at school. They thus develop the wider and deeper thorax, the more marked lumbar curve, and stronger abdominal muscles. Girls, on the other hand, are too often employed about the house, having less exercise and being less adequately drilled. Early in life they are apprenticed to some unsuitable trade which favours faulty body-development. (2) The second method by which the ptosis may develop is one whereby the abdominal muscles atrophy in later life. The common cause of this is frequent pregnancies, aided perhaps by the wearing of corsets.

Under ordinary conditions the ptosis will give rise to no symptoms, and in fact it has long been noted that the more extensive the ptosis, the less marked are the symptoms. If, however, the patient is one in whom the anatomical variation of membrane formation is present, then the ptosis will be incomplete. The viscera will be held up at certain points, so that kinking of the intestine and partial obstruction take place. It is therefore only in this variety—that is to say, the patient who, having the membrane formation, later develops ptosis—that symptoms are found.

SYMPTOMS.

I have previously shown⁴⁸ that a large number of patients present symptoms which simulate an organic disease. These patients may show only slight evidence of the ‘ptosis habitus’, although its presence can always be demonstrated by the *x* rays. Such symptoms will be local in character. In other patients, as Sir A. Lane has described, the symptoms are much more general.

Local Symptoms.—

1. *Cases resembling acute appendicitis.* This variety is much more common in young patients, the age varying from fourteen to twenty, and being most common at the age of seventeen; 80 per cent of the patients are females. The symptoms appear in definite attacks, and frequently the one for which the patient seeks advice is the first; but there may have been short previous attacks diagnosed as appendicitis for which no operation was performed. The onset will be with pain, which is at first diffused, but later becomes localized to the right iliac fossa. It is generally not so acute as in true cases of appendicitis, so that treatment is often not sought until the third or fourth day. During this time vomiting and constipation are present, and there may be a slight amount of pyrexia. On examination, there will be rigidity and tenderness in the right iliac fossa, and sometimes even an area of superficial tenderness over Poupart’s ligament, indicating that the appendix is taking part in the caecal dilatation. On palpation, there is evidence of dilatation of the caecum, as shown by splashing and gurgling. A diagnosis is often difficult, but the pain is less severe, and although the patient is often not seen until the fourth or fifth day, there is no local swelling such as would be expected with true appendicitis. At operation, the caecum is freely mobile, and there is a well-defined Jackson’s membrane. The removal of the appendix is followed by temporary relief, but the symptoms will reappear at a later date.

2. *Cases resembling chronic appendicitis.* This is the more common variety of the disease. About 80 per cent are females; but the average age is rather higher, being about twenty-eight years. There is a history of many attacks extending over several years, but they have not increased in severity. They occur frequently, often at intervals of only a few days or weeks. Each attack is short and lasts only a few hours or days, so that the patient may not have to lie up; but in the intervals of freedom there may be a certain amount of flatulent dyspepsia. The symptoms are often worse in the evening, and are

relieved by lying down. In the more acute attacks the pain is severe, and generally commences in the right iliac fossa. Vomiting is common, being much more frequent than in cases of true appendicitis, and giving little or no relief to the pain. There is no pyrexia, but headache and constipation are common. The 'ptosis habitus' is much more marked, although the abdominal muscles may appear normal. There is deep tenderness over the appendix, with distention and gurgling of the cæcum. The right kidney may be palpable, and an x-ray will show evidence of ptosis and stasis. At operation, there is a mobile cæcum with membrane formation, the latter often involving the appendix.

3. *Cases resembling gastric ulcer.* This variety is also more common in women, but the average age is yet higher, being about thirty-six years. The symptoms have extended over many years, and it is probable that this group includes many of the so-called acute gastric ulcers in young women. The attacks are frequent, and often the first is somewhat serious, lasting for two or three weeks, and then being followed by a considerable period of relief. Later the attacks become shorter and more frequent, so that they may last for only a few days, but recur again after short intervals. Moreover, there is rarely complete freedom in the intervals, as is found with true cases of gastric ulcer. There is pain in the epigastrium, which may be localized or radiating. It is severe, and usually comes on shortly after food, being often associated with flatulence. Rarely it may not appear until an hour or more after the meal is taken; but in either case it persists up to the time of the next meal. It is more marked at the end of the day, and is relieved by lying down. Vomiting is common, and occurs several times in each attack, and does not relieve the pain. Hæmatemesis occurred in 50 per cent of my cases, a percentage which is identical with that of chronic gastric ulcer. The loss of blood is often severe. The appetite is decreased, and there may be a complete loss of desire for food. The gastric acidity, as shown by a test meal, is usually diminished, but occasionally may be normal, or even raised. Neurasthenic symptoms are frequently present. On examination, a well-marked 'ptosis habitus' is found, there is splashing and gurgling over the cæcum and stomach, and one or both kidneys are felt. There may be superficial or deep tenderness in the epigastrium. An x-ray examination will show prolapse of the stomach and colon, general stasis, and perhaps an ileal kink. At operation, the stomach is prolapsed, and may show areas of local spasm: a point which it is important to remember, as such an area may be mistaken for a chronic gastric ulcer, and gastro-enterostomy unjustifiably performed.

4. *Cases resembling cholelithiasis.* This is a less common variety of the disease, but is most frequently seen about the age of forty. There is the same type of dyspepsia which is found in the last group, but the symptoms will be more constant. The patients will state that they are hardly ever free from flatulence and discomfort, which comes on almost immediately after meals. The discomfort or pain is situated in the epigastrium and right hypochondrium, is more severe at the end of the day, is increased by mental and physical fatigue, and in many cases is relieved by rest. In addition to these more constant symptoms, there will not infrequently be attacks of more severe pain appearing at regular intervals, persisting for several days, and simulating an attack of cholecystitis. In other cases the attack may be shorter, and the pain apparently so severe that it may be mistaken for biliary colic. In these attacks vomiting is not uncommon, but it will generally give little or no relief to the pain. The difficulty in diagnosis is often increased by the fact that true attacks of biliary colic may be caused by the mobile kidney, and that gall-stones not uncommonly co-exist with visceroptosis. The appetite is decreased,

especially so during the more acute attacks, and commonly the test meal shows the absence of free HCl. On examination, there is a well-marked 'ptosis habitus', with evidence of dilatation over the cæcum and stomach, a mobile right kidney, and a liver well below the costal margin. This structure may have a well-defined Riedel's lobe, which, simulating a dilated gall-bladder, may increase the difficulties of diagnosis. The exacerbations, with mental and physical fatigue, and the improvement of the symptoms with rest, are suggestive of ptosis; but even the presence of definite visceroptosis, as shown by clinical examination or x-ray investigation, does not eliminate the possibility of coincident gall-stones.

5. *Cases resembling carcinoma of the stomach.* Unlike the other varieties, this type is found more commonly in men, and is generally seen about the age of fifty. This is probably due to the fact that they are all cases of acquired ptosis, and being due to the commencing muscular feebleness of age, will be found at a later age in men more than in women. The symptoms therefore date back for a relatively short time, and will often be found following some period of overwork or mental strain. The onset will have been followed by constant pain in the epigastrium and right hypochondrium. The pain is, however, relatively slight, so that the complaint will be rather of a constant feeling of discomfort which rarely shows any severe exacerbations or remissions. It will vary in the course of the day, and will generally be increased by the ingestion of food. There may be a feeling of nausea, or the vomiting of a small amount of material. The vomiting rarely gives any relief to the pain. There is the usual feeling of distention and flatulence, and occasionally a slight hæmatemesis. The appetite is steadily and progressively lost, and is often associated with a profound decrease in body weight. The test meal will generally show the absence of free HCl, and a marked diminution of total acidity. On examination, the patient will be found to be thin, wasted, and anæmic. There is slight tenderness in the epigastrium, and splashing of the stomach and cæcum can often be elicited. No tumour will be palpable, but as this is often true of carcinoma it will be of little diagnostic value. The differential diagnosis is very difficult, and it is increased by the fact that where there is a possibility of carcinoma, too long a period of time must not be lost in watching the results of medical treatment. If there are definite evidences of ptosis, it will be justifiable to order one or two weeks' medical treatment, combined with absolute rest and freedom from worry. If this is not followed by a very rapid improvement, operation should be undertaken, lest an operable carcinoma of the stomach be overlooked.

General Symptoms.—In advanced types, where the stasis has become more permanent, there will gradually arise a group of symptoms which are in the greater part dependent upon toxic absorption. They will therefore be much more general in their effects, and less likely to suggest a localized lesion of any one part of the intestinal tract. It is to this variety that Sir A. Lane has directed so much attention. He shows that at first there is indigestion which is relieved by lying down, but later it is replaced by a continuous feeling of discomfort and fullness. The toxæmic symptoms, which are always more marked the nearer the stasis is to the large bowel, are shown by the presence of headache, which increases as the day goes on, lack of attention, and inability to perform routine work, nausea and occasional sickness, with progressive wasting. In long-continued cases there will be pyorrhœa, and pigmentation of the skin, most marked at the seats of pressure and in the areas which are normally more pigmented. Sweating is increased, and there is often a foul odour of the skin. The muscles are poorly developed, the cardiac action is enfeebled, and the respiration diaphragmatic. Chronic mastitis is an early

and constant sign, and is one of the symptoms which most rapidly improves by operation. These patients will generally have a history of severe past constipation; but as the disease develops they may frequently have attacks of diarrhoea, or even an onset of mucous colitis, which may be regarded as due to the intestinal irritation.

The above type of case is clearly defined, but it is very doubtful whether it is as frequent as Sir Arbuthnot Lane claims. Certainly in my own experience this extreme degree is relatively rare as compared with the varieties which show local symptoms. Lane, however, believes that the effects of the stasis are even more widespread than described above. Not only does he regard it as the direct cause of gall-stones, chronic gastric and duodenal ulcer, and carcinoma of the stomach, but he also states that the prolonged toxæmia lowers the patients' resistance and renders them liable to other infections; and indeed, that a patient without stasis will not be infected with tuberculosis or rheumatoid arthritis. The evidence of this thesis cannot yet be regarded as sufficient, and at present but few surgeons will be found to follow his lead in directing attention to the treatment of the stasis rather than to that of the local lesion.

MEDICAL TREATMENT.

The evidence detailed above shows that the membranes are congenital and cannot be prevented, but that the symptoms are due to the supervention of ptosis, for the cure of which much can be done. The best results will be obtained by preventive measures. With the wider introduction of exercises and drill, with better feeding and the abolition of child labour, it is probable that the physique of the girls will improve, and the supervention of ptosis be prevented. When once the disease has developed, a long course of treatment will be requisite. The details of such a course have been worked out by Martin,³⁷ Goldthwait,²⁰ and Coffey,⁹ among others. It must include: (1) Adequate rest, so that the overworked muscles may recover. In severe cases a course of complete rest in bed may be necessary; in milder cases, or in the later stages, periods of rest between the exercises will be sufficient. (2) The aid of gravity must be called in to return the viscera to their normal position; thus, many of the exercises should be performed in the prone or inclined position. (3) The skeletal muscles and body shape must be improved. This will require special exercises, attention being specially given to those which improve the lumbar curve and widen the lower thorax. (4) The body fat must be increased. To a certain extent this result may be obtained by increasing the amount of rest; but there is no doubt that relief from mental worry will also have a very important effect upon the body weight. (5) The stasis must be overcome. The exercises and dieting will aid in this direction, but in the early cases at least suitable aperients will have to be administered.

By this means very satisfactory results are sometimes obtained; but not infrequently they fail for the following reasons: (1) A bad body habit is already acquired, so that the exercises will have to restore the body shape as well as to improve the muscles. (2) The patients are generally of the poorer classes, and thus cannot spare time from their work for the necessary rest and exercises. (3) The poverty of the patients is often a cause of underfeeding. (4) In the late stages the bands and membranes have undergone secondary shortening, so that they prevent the viscera returning to their normal position. (5) The patient may have developed neurasthenic symptoms, and so will not willingly collaborate with the treatment. To overcome the first three difficulties, Russ¹⁶ has advocated that the treatment should be institutional. The only objection to this is that it is often impracticable, owing to the large number of patients

PLATE XLII.

VISCEROPTOSIS—*continued*



Fig. A.—Showing line of division of Jackson's membrane and Lane's kink.

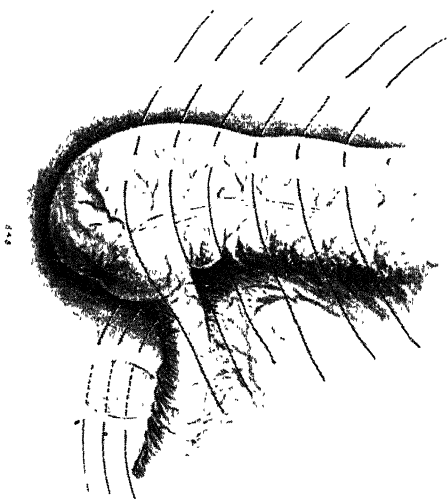


Fig. B.—Appendix has been removed. Sutures inserted for enclosure of bare area, after division of Lane's kink and caecopexy.

PLATE XLIII.

VISCEROPTOSIS—continued

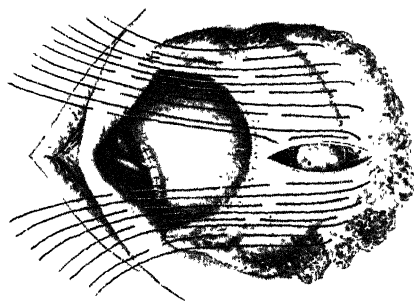


Fig. 1.—Coffey's operation of gastrocolopexy. (After Coffey.)

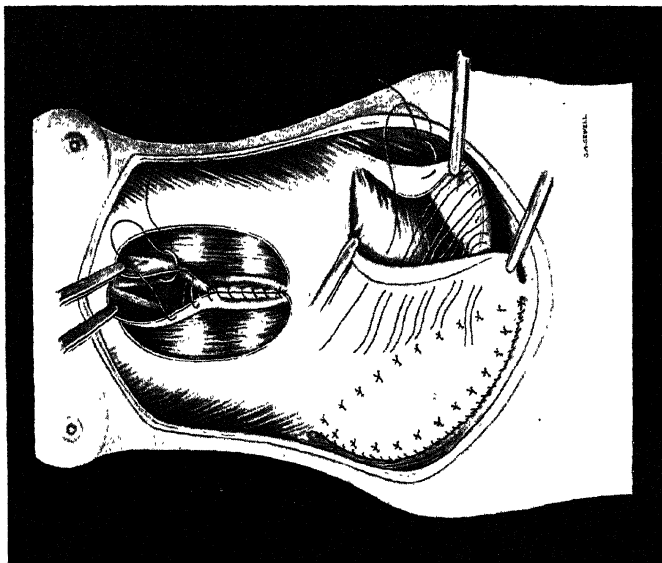


Fig. 2.—Coffey's operation for refashioning the abdominal cavity. (After Coffey.)

and the length of time they would require to be in hospital. The same difficulties may to a certain extent be overcome by teaching the patient a series of exercises which she can carry out at home, and by ordering an abdominal belt so that less time may be required for rest. Such a belt will have to be carefully fitted, and must be applied while the patient is lying down. It should contain no pads which exert injurious pressure. A Curtis belt is the support most frequently advocated, but personally I much prefer a well-fitting laced belt. The last two objections can only be overcome by some form of operative treatment; but it will be evident that with changes so widespread the operation must be regarded, not as a means of cure, but as an adjunct to the exercises; for even if it be so devised that the viscera are held in place, it will still be necessary to develop the skeletal muscles and restore the body shape.

SURGICAL TREATMENT.

From time to time many different forms of surgical treatment have been advocated. This is largely due to the fact that so many views have been held as to the cause of the disease, and each operation has been devised to overcome what is regarded as the primary factor.

Division of the Membranes and Bands (Plate XLII).—It would seem probable that a free division of the membranes and bands would overcome the kinking and obstruction, and would thus free the patient from her symptoms. The ptosis, however, would still be present, and therefore an attempt should always be made after division of the bands to restore the body shape by exercises and massage. In very advanced cases there may be so much secondary atony of the intestinal wall that this operation will be insufficient. It should in no case be performed unless attempts have been made to cure the condition by medical treatment.

The indications for this operation may be summarized as follows: (1) Only after palliative and orthopaedic measures have failed; (2) As a means of aiding the orthopaedic measures, and never as a curative operation; (3) Where the stasis is not extensive and of long standing; (4) Where it is impossible to distinguish the condition from an organic lesion.

In performing the operation, free access may best be obtained through a right pararectal incision. The site of all the membranes must be examined, and any bands freely divided. Attempts should then be made to cover over resulting raw areas. As soon as the wound is healed, gentle massage and exercises should be instituted.

Many surgeons have gained good results from this procedure. Gray and Anderson²¹ state that all their cases have been relieved of their pains, and the majority have gained normal health. They admit that a sufficient length of time has not elapsed since the operations upon their cases for them to claim that the results are permanent. Jackson²⁵ found that 75 per cent of his cases gained complete relief by this method, and equally good results were obtained by Pilcher.⁴² The objection has been raised that adhesions are likely to be formed, and that peritonitis may follow; such complications having been reported by Sir Arbuthnot Lane,³⁵ Hughes,²⁴ and Fagge.¹⁶ As a curative measure it is almost certain to fail. I have published⁴⁸ a series of cases where the after-results were watched for a prolonged period, and found that the temporary relief was followed by a return of symptoms. Further experience with over 160 cases has shown that if the operation be followed by a course of massage and exercises considerable permanent benefit will result.

Fixation of the Viscera.—Many surgeons, acting upon the assumption that the ptosis is the primary change, have attempted to fix the prolapsed viscera.

Wilms,⁵⁰ regarding the atony and dilatation of the cæcum as the primary cause, advocated cæcoplexy. Coffey,⁹ Rovsing,⁴⁵ Morley,³⁸ and Pringle⁴³ have also advised fixation of the cæcum and ascending colon, but only as a part of more general methods. They advised division of all membranes, and fixation of the other mobile viscera, such as the stomach, transverse colon, liver, and even the kidney. Many attempts have been made to fix the ptosed stomach. Among the earlier was Duret's¹² operation, which plicated and fixed the lesser curve of the stomach. The methods most frequently advocated to-day are those of Coffey and Rovsing.

*Rovsing's operation.*⁴⁵ Through a vertical mid-line incision, three strong silk threads are led in and out through the serous coat of the stomach, parallel to the lesser curvature, and omitting the pyloric portion. The serous coat and parietal peritoneum are now scarified, and the ends of the threads led out

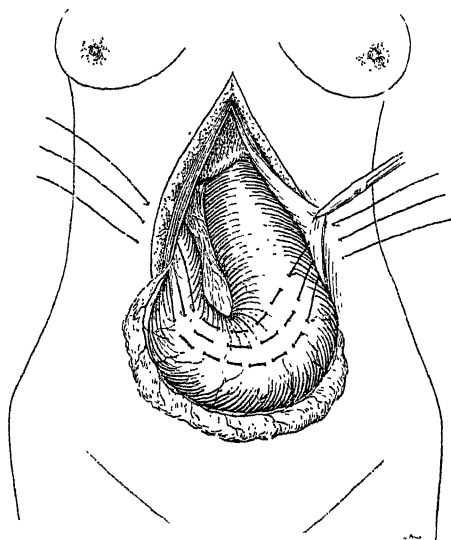


Fig. 52.—Rovsing's operation for gastropexy. (After Rovsing).

through the entire thickness of the abdominal wall, those on the left as far as the rib curvature, and those on the right 3 cm. from the mid-line. The abdomen is closed, and the silk sutures are tied over a glass plate covered with sterile gauze (Fig. 52).

*Coffey's operation.*⁹ The abdomen having been opened in the mid-line, the falciform ligament is shortened, and the liver fixed to the parietal peritoneum, by mattress sutures. A second series of mattress sutures are now passed through the parietal peritoneum, the gastrocolic omentum, and the great omentum, so that when tied they raise and fix the colon and greater curvature of the stomach (Plate XLIII, Fig. A).

There are many objections to fixation of the viscera. It will probably interfere with the normal action, and is often unsuccessful in that the adhesions thus formed will be drawn out as attenuated bands. If one viscus alone be fixed, the point of fixation is likely to act as a further band or membrane around which kinking of the unfixed viscera may take place, and indeed both

Coffey and Rovsing have generally found it necessary to supplement gastropexy by hepatopexy, cæcopexy, and even nephropexy. There is, however, an increasing tendency to perform one or other of these operations—a tendency which in my own experience has but little to support it. I have found that after such operations the symptoms have persisted, and *x*-ray examination has shown that the ptosis is far from being cured. It is my custom to perform it but rarely, and only in those cases where the symptoms are limited to the stomach or cæcum, and where there is a very marked ptosis of one of these viscera with little or no change in the rest of the intestinal tract.

Attempts to Refashion the Abdominal Cavity.—Both Coffey⁹ and Rovsing¹⁵ have introduced operations which aim at overcoming the narrowing of the upper, and the widening of the lower, abdomen. Coffey states that in all cases of surgical ptosis the upper abdomen has become permanently narrowed, and he therefore always performs this step in operating upon patients with mid-line ptosis. He first fixes the viscera in the manner previously described, and then splits the anterior rectus sheath one inch from the median incision. The flaps thus formed are turned inwards and sutured upon their free edges, thus widening the upper abdomen by two inches. Rovsing performs a somewhat similar step, but the flap which is turned inwards consists of the anterior half of the rectus muscle as well as the sheath. The pendulous lower abdomen is narrowed by splitting the external oblique in the line of its fibres. The inner and upper flap is dissected up, drawn over the lower flap, and sutured in position. The value of this step is difficult to determine, as it is nearly always combined with other procedures upon the mobile viscera. It has, however, many theoretical and practical objections. If combined with fixation of several viscera, it becomes an operation of some severity. It is generally recognized that it is impossible permanently to shorten any prolapsed ligament or aponeurosis by taking a reef in it, and indeed such methods are likely to further weaken the abdominal muscles, the loss of tone of which is one of the most important predisposing causes of ptosis. The operation will do nothing to overcome the contraction of the lower thorax, which can only be improved by suitable exercises. In all the cases I have seen at some considerable time after this operation, the upper abdomen and thorax were still narrow, and not uncommonly there was a ventral hernia. (*Plate XLIII, Fig. B.*)

Attempts to Overcome Stasis.—These methods include diverse operations, which have only this in common, that they attempt to overcome the intestinal stagnation. Plication of the viscera has been frequently advocated, and was first suggested by Wilms as a means of overcoming the cæcal dilatation. Duret's operation upon the stomach is one example of this method. These operations have now been almost wholly abandoned, for it is realized that if there be dilatation of the viscus it will be largely dependent upon some form of obstruction beyond, and in such a condition no form of narrowing can be permanent.

Appendicostomy has of late been advocated by Mummery,⁴⁰ and especially in those cases where the colon is dilated and sacculated, and where it is not possible to deal directly with the obstruction. It is probable that this form of operation will be more frequently undertaken, particularly where the presence of diarrhoea and hemorrhage suggests that there is some chronic colitis. The fact that the operation has in the past proved so unsatisfactory in the treatment of mucous colitis, a condition which is not uncommonly associated with ptosis, would suggest that great care must be used in selecting cases for this treatment.

Of late years attention has been widely directed to the two operations of *ileocolostomy* and *colectomy*. It is to Sir Arbuthnot Lane²⁹⁻³⁰ that we owe the

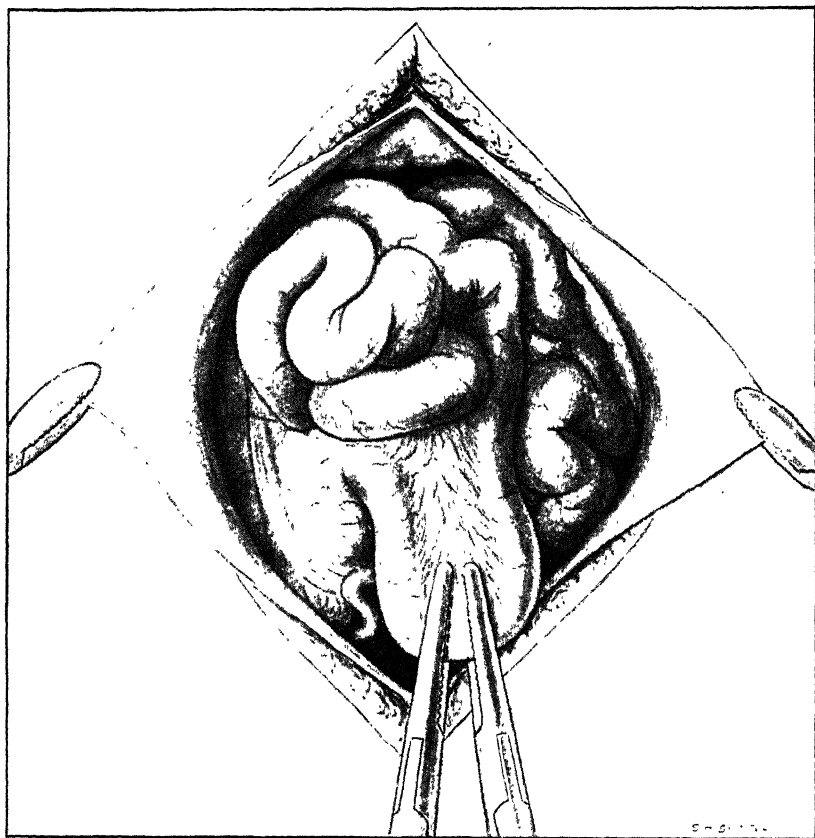
evolution of this treatment, and he and his co-workers claim remarkable cures by its use. In the early stages the operations were only performed as a cure for pain, but later were largely undertaken for the relief of those conditions which he regards as dependent upon auto-intoxication. He now performs these operations for chronic constipation, for the cure of mastitis, for tuberculosis and rheumatoid arthritis of joints, and even for gall-stones and gastric ulcer. His views that these conditions are secondary to auto-intoxication, and can be cured by the methods which he advocates, have not been generally accepted, for the proofs cannot be regarded as adequate. The anatomical evidence proves that the membranes are present in the foetus. Hurst³³ shows that there is no gastric stasis in visceroptosis; and my own experience has been that, out of a series of 273 cases of gastric and duodenal ulcer, there were only 9 who had ptosis which continued to give symptoms after the ulcer was surgically treated. Lane and his co-workers, however, have claimed so much benefit for their patients that his views must have very serious consideration. He states that the danger of this treatment is slight, and that even colectomy is an operation of moderate severity, the only risk being the formation of adhesions. He states that the immediate risk of ileocolostomy is greater than that of colectomy, convalescence after the latter being less serious and anxious. The explanation of the greater freedom from risk in colectomy is that the intra-abdominal tension is much reduced by the removal of the large intestine. If the colon be left, there may be an accumulation of faecal material within it which may necessitate operation at a later date. He advocates colectomy when the cæcum and colon are prolapsed with long mesenteries and but few secondary membranes. In fat patients having short mesenteries and many adhesions, ileocolostomy is preferable.

*Ileocolostomy.*³⁴—A 5- to 7-in. left pararectal incision is made, and the ileum is divided between two clamps, in immediate continuity, 4 to 5 in. from the cæcum (*Plate XLIV*). The distal aperture is closed, and the proximal end united by a layer of seromuscular sutures to the upper part of the pelvic colon, care being taken to place the ileum snugly against the colon without any twist in its long axis. An opening is now made into the side of the pelvic colon of the same length as the diameter of the small intestine, and the edges of the two viscera are united with through-and-through sutures of silk thread. The anterior layer of seromuscular sutures is now completed. The mesentery of the ileum is carefully sutured to that of the colon, both on the lower and upper aspects of the junction. A tube is passed up the rectum by an assistant, and guided by the surgeon's fingers through the anastomosis into the ileum for about eight inches. The wound is now closed, and the tube kept *in situ* for about five to six days. During the course of the operation shock is combated by subcutaneous injections of saline.

*Colectomy.*³⁵—A somewhat longer incision is made, and the evolutionary adhesions are freely divided. This is especially necessary in the region of the splenic flexure where they are highly developed. The removal of the intestine will begin at the cæcum, where the outer reflection of the peritoneum is divided, and this viscus, together with the ascending colon, drawn inwards. By this means the inner layer of peritoneum, together with the vessels, will be lifted up, and the latter can be ligatured and divided (*Plate XLV*). In the region of the transverse colon the vessels will be divided both in the mesocolon and in the great omentum. The pelvic colon is drawn up out of the pelvis and grasped with two pairs of clamps about 2 in. above the pelvic brim. The ileum is divided about 5 in. from the ileocæcal valve, and the proximal end directly attached to the cut end of the pelvic colon, the anastomosis being performed with two rows of sutures (*Plate XLVI*). The cut edges of the mesentery of

PLATE XLIV.

VISCEROPTOSIS—continued



Showing how the ileum is grasped between two pairs of forceps preparatory to division, which is done usually by a cautery.

*Plates XLIV to XLVII by kind permission of the 'British Journal of Surgery,'
from an article by Sir Arbuthnot Lane. (Vol. II., p. 599.)*

PLATE XLV.

VISCEROPTOSIS continued



Shows the method of ligaturing the mesentery of the large bowel

(Sir A. Lane).

PLATE XLVI.

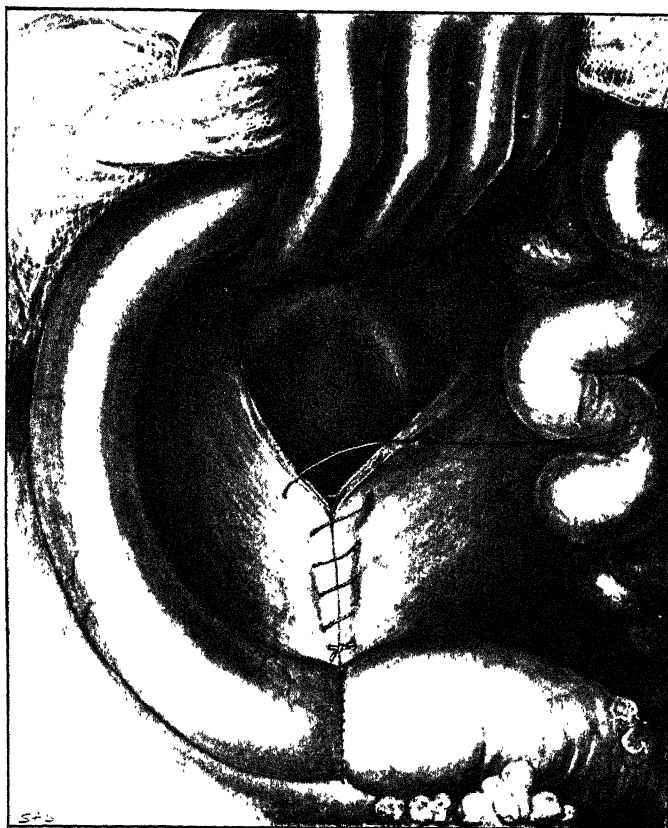
VISCEROPTOSIS—continued



The pelvic colon drawn up out of the pelvis and grasped by forceps for division in a similar way to that shown in *Plate XLIV.* (*Sir A. Lane*)

PLATE XLVII.

VISCEROPTOSIS---continued



Final suture of the mesentery.

(Sir J. Lane.)

the ileum and of the pelvic colon are sutured together, care being taken that no raw surface is left either on the upper or lower aspect of the junction (*Plate XLVII*). An oesophageal tube is passed through the junction in the same manner as in the first operation.

Several lists of cases showing the after-results of these operations have been reported by Sir Arbuthnot Lane and his co-workers; the majority of the operations having been performed by Lane himself. Chappel⁹⁷ gives a detailed description of 50 cases, all of whom stood the operation well, and made rapid and complete recoveries from their symptoms. Bainbridge² reports another series of 106 patients, of whom only 8 died as a result of the operation, the remainder being apparently greatly improved. Barrington Ward⁴⁹ describes a series of 12 children operated upon for tuberculosis of the joints. Only one died, and the remainder made satisfactory progress.

There is, however, a widespread opinion that the results are, as a rule, much less satisfactory. Hertz²³ lays stress upon the fact that intestinal stasis is not in itself a fatal disease, and that not only has the surgical treatment been the direct cause of death in several cases, but that he has been consulted by patients whose condition was either no better or was actually worse after operation.

Fagge and Hughes¹⁵ analyzed a series of 33 operations performed for diseases of the joints. Death followed in 8. Of the 23 patients suffering from tuberculosis of the joints, 6 died, and 8 could not be traced; of the remaining 9 cases, 2 continued to have sinuses, and 7 had considerable resulting deformity, although the sinuses were healed. These results are not encouraging, and will not compare favourably with those obtained when the patients are treated on orthopaedic lines; nor do the accounts lead one to believe that the improvement gained in the cases of rheumatoid arthritis was greater than would have been expected after medical treatment. Barling³ gives the detailed notes of 4 cases. The first one had three operations, the last of which was a colectomy; she died on the third day after the last operation. The third case, which was apparently allied to Still's disease, died nine months after an ileocolostomy, with no improvement in the joint condition. The second case resumed part of her work, but the bowels acted irregularly. In the fourth case, the ileocolostomy was followed by diarrhoea, the bowels being opened seven to nine times daily.

Mothersole,³⁹ having performed ileocolostomy and having found the results unsatisfactory, adopted colectomy. He only removed the caecum, the ascending colon, and the first half of the transverse colon—a form of operation which has also been advocated by Crile.¹¹ Mothersole gives the details of 14 cases, which all recovered from operation, but the after-results do not appear altogether satisfactory. Two of the patients showed progressive mental deterioration, and one committed suicide. Three of the others continued to have symptoms. Clark⁸ found that in a series of 12 cases the after-results were unsatisfactory in 50 per cent. He states that the operation carried too high a mortality, and the ultimate post-operative results were too unsatisfactory to justify so hazardous a procedure.

For these reasons a large number of surgeons have been led to abandon the operation unless for very exceptional cases. That the operations can be safely accomplished, and that the mortality is considerably less than was at one time believed, is admitted by all. At the same time both operations must still be regarded as of considerable severity. My own experience, based on over 160 cases of visceroptosis treated by operative measures, has shown that they are nearly all greatly relieved, if not cured, by simple division of the membranes and bands, the operation being, however, followed by a course of medical

treatment. It would therefore appear that ileocolostomy and colectomy should only be advocated in advanced cases where all other methods of treatment have failed.

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VITAL-FUNCTION TESTS.

Oskar C. Gruner, M.D.

The investigation of clinical material in order to ascertain the functional efficiency of the different organs has been pursued with increasing earnestness. Hence the art of clinical diagnosis is rapidly crystallizing into a systematic endeavour to gather together the various laboratory and other methods towards the elucidation of the functional power of these organs. The most modern trend is to devise tests which are likely to tax the various organs to the utmost, in order to observe how they behave under such conditions. These are 'endurance tests'. Primarily and most obviously they apply to muscular power, or cardiac efficiency, but the different kinds of test meal are being closely studied: the administration of urea, of chlorides, of adrenalin, of creatine, to

test the liver, the kidney, and the spleen, are instances of the greater inroads being made into attaining clear conceptions about the patient's bodily and mental state. (*See KIDNEY, PANCREAS, LIVER, SPLEEN, STOMACH; also LATENT DISEASE.*)

REFERENCE.—W. M. Barton, *Vital Function and Testing Methods*, Boston, 1918.

VITAMINES, AND THE DEFICIENCY DISEASES. (*See also* BERI-BERI; DEFICIENCY DISEASES; INFANT FEEDING; LATHYRISM; PELLAGRA; RICKETS; SCURVY.)

Robert Hutchison, M.D., F.R.C.P.

The study of 'vitamines' and their relation to health has received a fresh impetus as a result of the war, and there has been a considerable addition to our knowledge of the subject in the past year. The term 'vitamine', it will be remembered, was first introduced by Casimir Funk to designate certain bodies of unknown nature which, although only present in minute quantities in the diet, are yet essential to healthy nutrition. Of the chemical composition of these bodies we still know almost nothing, but there seems to be no doubt they are definite 'entities', nitrogenous but not protein in nature, free from phosphorus, and highly susceptible to external agencies such as heat, drying, the action of alkalis, etc. They have not yet, however, been isolated in a state of sufficient purity to enable an exact analysis of them to be made, and as the term 'vitamine' seems to imply more precise knowledge of their constitution than we really possess, it is falling into disuse, and the phrase 'accessory food factors' is now generally used instead.

A memorandum drawn up by a joint committee of the Lister Institute and the Medical Research Committee, for the guidance of those engaged in the administration of food relief to famine-stricken districts, embodies most of our present knowledge about these bodies and their relation to the 'deficiency diseases', and what follows is taken from a summary of this memorandum in the *Lancet*.¹

ACCESSORY FOOD FACTORS.

The accessory food factors at present recognized are three in number :—

1. Antineuritic or anti-beri-beri factor, identified with the 'water-soluble B' growth factor of the American investigators.
2. Fat-soluble A growth factor or antirachitic factor.
3. Antiscorbutic factor.

As far as is known, the accessory food factors cannot be produced by the animal organism, and all animals are dependent for their supply directly or indirectly upon the plant kingdom.

DISTRIBUTION AND PROPERTIES OF THE ACCESSORY FACTORS.

1. *Antineuritic or Anti-beri-beri Factor* ('water-soluble B' growth factor of the Americans).—This vitamine prevents the occurrence of beri-beri in man and analogous diseases in animals. It is also necessary to promote satisfactory growth in young animals. It is widespread, and is found to some extent in almost all natural foodstuffs. Its principal sources are the seeds of plants and the eggs of animals, where it is deposited, apparently, as a reserve for the nutrition of the young offspring. Highly cellular organs, such as the liver and the brain, contain considerable amounts of this vitamine; flesh contains comparatively little. Yeast cells are a rich source; so also are yeast extracts—e.g., 'marmite'. In the case of peas, beans, and other pulses, this vitamine is distributed throughout the seed, but with cereals it is concentrated in the germ (embryo) and in the peripheral layer of the seed, which in milling is peeled off with the pericarp and forms the bran.

Beri-beri is occasioned by a diet composed too exclusively of cereals from which germ and bran have been removed by milling, as in the case of polished rice or white wheat flour. The disease is common where polished rice is the staple article of diet to an almost entire exclusion of other foodstuffs. It is rare, though not unknown, where white wheat bread is eaten, because the consumption of this type of cereal food is usually accompanied by a sufficiency of other foodstuffs containing the essential principle. It is unknown where rye bread is the staple food, because in the milling of rye there is no separation of the germ.

2. *The Fat-soluble A Growth Factor or Antirachitic Factor* necessary to promote growth and prevent rickets in young animals.—This vitamine appears to be necessary also to maintain health in adults, and it has been suggested that war oedema may be due to a lack of this factor in the diet. The main sources of this factor are two in number: (1) Certain fats of animal origin; (2) Green leaves. The most notable deposits of this factor are in cream, butter, beef fat, fish oils (for example, cod-liver oil, whale oil), egg yolk. It is present in very small or negligible amount in lard (pig fat) and in vegetable oils, as, for example, linseed oil, olive oil, cotton-seed oil, cocoanut oil, palm oil; pea-nut or arachis oil is reported to contain it in larger amount. It will be noticed that this factor is found chiefly in the more expensive fats.

While green-leaf vegetables contain the fat-soluble factor, root vegetables are deficient in it; war oedema has been frequently reported under circumstances in which root vegetables have formed a large proportion of the diet.

3. *Antiscorbutic Factor*.—This vitamine is necessary in a diet for the prevention of scurvy, and is found in fresh vegetable tissues and (to a much less extent) in fresh animal tissues. Its richest sources are such vegetables as cabbages, swedes, turnips, lettuces, watercress, and such fruits as lemons, oranges, raspberries, tomatoes. Inferior in value are potatoes, carrots, French beans, scarlet runners, beetroots, mangolds, and also (contrary to popular belief) lime-juice. Potatoes, although classed among the less valuable vegetables as regards antiscorbutic value, are probably responsible for the prevention of scurvy in northern countries during the winter owing to the large quantities which are regularly consumed.

Milk and meat possess a definite but low antiscorbutic value.

This vitamine suffers destruction when the fresh foodstuffs containing it are subjected to heat, drying, or other methods of preservation.

All dry foodstuffs are deficient in antiscorbutic properties; such are cereals, pulses, dried vegetables, and dried milk.

Tinned vegetables and tinned meat are also deficient in antiscorbutic principle. In the case of tinned fruits the acidity of the fruit increases the stability of the vitamine, and prevents to some extent the destruction which would otherwise occur during the sterilization by heat and the subsequent storage.

PRACTICAL APPLICATION OF THE FOREGOING FACTS TO THE PREVENTION OF DISEASE.

1. *Prevention of Beri-beri*.—It is unlikely that any danger of beri-beri will arise among the famine-threatened districts of Eastern Europe as long as wholemeal flour from rye, wheat, barley, maize, or peas, beans, and lentils is provided. Mere shortage of food does not cause beri-beri, and poverty ensures that the whole grain is consumed for purposes of economy.

2. *Prevention and Cure of Rickets or Growth Failure in Children or War Oedema in Adults*.—Evidence is accumulating that rickets is caused by a shortage, not of fat as such, but of the 'fat-soluble growth factor' which is

contained in certain fats. Xerophthalmia, a severe disease of the external eye, leading, if untreated, to blindness, has also been attributed to lack of this factor. Infants and young children must therefore be supplied with the *right kind of fat*. To prevent rickets : (1) Full-cream milk should be secured for artificially-fed infants when possible ; failing that, (2) Full-cream dried milk ; or (3) Full-cream unsweetened condensed milk. (2) is preferred to (3), and, in case of ignorant or careless mothers, even to (1), in order to prevent spread of infection and intestinal disorders. In all cases where (2) or (3) are used an extra antiscorbutic should be given (see below).

Sweetened condensed milk is undesirable, for the reason that the degree of dilution required by the high sugar content renders the food, as prepared, deficient in the fat-soluble (antirachitic) factor as well as in fat and protein.

Milk and butter are the best sources of the antirachitic (or fat-soluble) factor for young and growing children ; margarines made from animal fats are also valuable ; those made from vegetable oils are to be condemned. If there is a shortage of butter it should be reserved for children, but if totally lacking the deficiency can be replaced by cod-liver oil and other fish oils, or by eggs. If all animal fats are unavailable, pea-nut oil should be selected in preference to other vegetable oils for preparation of margarines, etc., and some effort should be made to utilize the fat-soluble vitamines contained in green leaves.

Green leaves are a cheap and readily available source of the fat-soluble vitamines, and adults can probably maintain good health when animal fats are substituted by vegetable fats, if green-leaf vegetables are consumed in fair quantity. In case of this vitamines the loss involved in ordinary cooking is not serious. Unfortunately, infants or very young children cannot take green vegetables in the ordinary way, but the juices expressed from cabbages and other green-leaf vegetables, raw or even after steaming (not immersing in boiling water) for a few minutes, might be given even to infants if all other sources of this most necessary vitamines have failed.

Purées, carefully prepared from cooked spinach or lettuce, can be tolerated in small quantities (one teaspoonful daily) by many young infants, and the amount taken can be increased regularly with age.

In cases where rickets or growth failure or xerophthalmia are already well established, a daily dose of cod-liver oil is essential in addition to all other procedure.

3. Prevention of Scurvy ; use of Germinated Seeds.—If fresh vegetables or fruits are scarce or absent, an antiscorbutic food can be prepared by moistening any available seeds (wheat, barley, rye, peas, beans, lentils) and allowing them to germinate. It is necessary, of course, that these should be in the natural whole condition, not milled or split. The seeds should be soaked in water for twenty-four hours, and kept moist with access of air for one to three days, by which time they will have sprouted. This sprouted material possesses an antiscorbutic value equal to that of many fresh vegetables, and should be cooked in the ordinary way for as short a time as possible.

In case of shortage it should be remembered that salads are of more value than cooked vegetables. The extent to which the antiscorbutic factor is destroyed during cooking depends chiefly upon the time employed. When supplies are limited, vegetables should be cooked separately and for as short a time as possible ; they should not be cooked for long periods with meat in soups or stews.

Preserved foods, with a few exceptions, may be regarded as devoid of the antiscorbutic principle. Lemon-juice retains some value in this respect ; canned tomatoes (and presumably other tinned acid fruits) have also anti-

scorbutic value. *Canned vegetables are useless for prevention of scurvy, as also are dried vegetables.*

Infantile scurvy must be considered separately, as many of the above food-stuffs are unsuited to infants or young children. To avert danger, all artificially nourished infants should receive an extra antiscorbutic. Cow's milk, even when raw, is not rich in the antiscorbutic vitamine; when heated, dried, or preserved, the amount contained is still further reduced. The most suitable antiscorbutic material to use is fresh orange-juice, 1 to 3 or 4 teaspoonfuls (5 to 15 c.c.) daily, according to age. Raw swede- (or, if unavailable, turnip-) juice is a potent antiscorbutic, and an excellent substitute for orange-juice; to obtain the juice the clean-cut surface is grated on an ordinary kitchen grater, and the pulp obtained is squeezed in muslin. Tomato-juice, even from canned tomatoes, and grape-juice can also be used; the latter is, however, less potent than orange-juice, and a larger dose should be given.

Pregnant and Nursing Mothers.—If babies are breast-fed it is important that the pregnant and nursing mother should receive an adequate supply of antiscorbutic food in her diet. The popular belief that green vegetables are harmful in such cases is often without foundation. Infantile scurvy is not unknown in breast-fed children.

REFERENCE.—*Lancet*, 1919, ii, 28.

VITILIGO.

E. Graham Little, M.D., F.R.C.P.

A joint report¹ on this subject by a mixed tribunal of English, French, and Belgian medical officers of a dermatosyphilitic centre concerns 50 cases of vitiligo, 48 men and 2 women, the cases falling into two classes according as the condition was noted as commencing before or after the twentieth year, this limit being chosen as roughly the time of acquired syphilis. In the second category, of 20 cases, 9 were definitely syphilitic, 8 were very probably syphilitic, and of the 8 remaining cases several were suspiciously like syphilis. In the first category, of 30 cases, in 5 symptoms of hereditary syphilis were definite, and in 12 were suspect. The conclusion the authors suggest is that vitiligo commencing in adults is in the majority of cases associated with syphilis, and that evidence for that association is less convincing when the vitiligo commences in childhood.

Lane² supports the French school in drawing a distinction between vitiligo, which indicates an achromia in combination with an increase of pigment, and leucoderma, which is a pure achromia. He considers the frequency with which a positive Wassermann test has been obtained in cases of vitiligo points to syphilis as the commonest cause. In the discussion which followed the paper, Pusey could not agree that there was any recognizable difference between leucoderma and vitiligo, and denied the relationship with syphilis, and these views commanded the widest assent in the discussion.

REFERENCES.—¹*Presse Méd.* 1918, Dec. 12, 640; ²*Jour. Amer. Med. Assoc.* 1919, July 5, 27.

WAR NEUROSES. (*See NEUROSES OF WAR.*)

WAR ŒDEMA. (*See DEFICIENCY DISEASES; VITAMINES.*)

WARTS.

E. Graham Little, M.D., F.R.C.P.

ETIOLOGY.—Wile and Kingery¹ ground up material from ordinary warts and passed these through a Berkefeld filter candle. The material thus obtained was tested for its sterility on ordinary culture media. The material was then injected with a fine syringe intra-epidermally in several volunteers,

including the investigators themselves. About four weeks later small, flat, wart-like lesions were found to have appeared at the sites of inoculation. The lesions increased slowly in size, taking on more and more the characteristics of flat warts. A certain tendency to spontaneous resolution in some was noted. For the most part the lesions remained for many months. In two cases the warts reached a large size and became typically roughened and hypertrophic. The authors were unable to determine that the virus maintained its virulence when kept in glycerin. Histologically the excised warts taken at this time showed the changes identical with those found in ordinary warts.

The conclusions are: (1) The sterile filtrate of wart material injected intracutaneously is capable of producing localized hyperkeratoses which are clinically and pathologically identical with verrucæ vulgares. (2) The initial experimental lesion starts as a flat wart, which in no way differs from that seen in verruca plana. (3) Interpapillary hypertrophy, inflammation, and marked hyperkeratosis occur as secondary traumatic manifestations, and the authors are agreed with Unna that the initial change consists of an acanthosis and flattening of the papillæ. (4) Without denying that it is still possible that localized hyperkeratosis resembling verrucæ may be due to trauma or foreign bodies, it is definitely demonstrated that such changes can be caused by a filtrable virus. It is not unlikely that when trauma and foreign bodies apparently are present as inciting factors, they may merely represent the point of entrance of an infectious agent such as has been determined in these experiments.

TREATMENT.—Ind² recommends the following procedure for multiple flat warts. The warts and surrounding skin are painted three times a day for one day with a saturated alcoholic lotion of Salicylic Acid. On the following day the warts are levelled with a sharp cutting instrument bevelled on one side only, and immediately painted with the salicylic lotion, which is twice repeated on the same day. The treated area should be bathed with pure alcohol once a day until the scabs have dropped off.

REFERENCES.—¹*Jour. Amer. Med. Assoc.* 1919, lxxiii, 970; ²*Brit. Med. Jour.* 1919, ii, 11.

WHOOPIING-COUGH IN THE NEWLY-BORN.

Frederick Langmead, M.D., F.R.C.P.

Herman B. Sheffield³ describes an interesting group of 11 cases of infants from nine to twenty days old. In all, the source of the infection could be traced to members of the immediate family. Four infants contracted the disease from their mothers, but as they showed no signs of nasopharyngeal or bronchial catarrh for the first few days after birth, there was every reason to believe that the infection was post-natal and that no immunity was transmitted by their mothers.

The condition in the newly-born has received very little attention in the literature, though the mortality is very high and the symptoms vary greatly from those in older children. The stages of the infection are less defined, the catarrhal and paroxysmal stages being confluent, and the former often of so short a duration as to escape observation. Beginning with mild sneezing or coughing a few days after birth, the baby is found to be struggling for air with each fit of coughing; it turns blue or even black in colour, and after a few efforts of expectoration followed by expulsion of frothy mucus, falls back pale and exhausted, half unconscious. The paroxysms return at varying intervals, generally every five or ten minutes. The attacks of apnoea are almost always accompanied by temporary arrest of the heart's action, and death during the paroxysm is not uncommon in delicate infants. It occurred in 2 of the cases,

age twelve and fifteen days respectively. Of the remaining 9 cases, 2 recovered, 5 died from hypostatic pulmonary congestion, 1 from cerebral hæmorrhage, and 1 from inanition. In one case the pulmonary condition was accompanied by rupture of the alveoli and a rapidly-extending subcutaneous emphysema. The cerebral hæmorrhage of pertussis is usually localized, giving rise to monoplegia or hemiplegia; this may lead to confusion in diagnosis, especially in infants born instrumentally and showing evidences of injury by forceps. Congenital heart disease and hypertrophy of the thymus are other difficulties in diagnosis, on account of the cyanosis common to all. In congenital heart disease, however, the blueness is permanent, or only apparent with fits of crying, whilst physical signs are generally detectable. A thymus which is sufficiently large to cause obstructive symptoms is usually accompanied by dullness over the upper part of the sternum, particularly to the left as low as the second rib, and also in the back between the scapulæ. The asphyxial paroxysms with a large thymus are less marked and less frequent than in whooping-cough. Cases of whooping-cough in the newly-born may be mistaken for atelectasis, but the condition is usually preceded by asphyxia neonatorum, and is not accompanied by fits of coughing. A blood examination may help, for in whooping-cough there is an increase in the leucocytes; but the relatively large numbers of lymphocytes in the blood of the newly-born diminishes the value of this test in young infants.

The chief treatment is preventive. Every effort must be taken to guard the newly-born infant from acquiring the disease by transmission from the mother or other member of the family. With only a suspicion the infant must be isolated promptly, and, with further evidence of the existence of the disease in the household, immunized immediately. Prophylactic *Pertussis Vaccine* in full doses is quite harmless even in very young infants. In some cases the paroxysms are too frequent and severe for suckling at the breast to be possible; it is then advantageous to administer the breast-milk through a tube. Active treatment is very unpromising. Pertussis vaccine proved useless in four cases. Some benefit may follow the early administration of *Bromides* and *Ipecacuanha*, and of *Strophanthus* to sustain the cardiac action. Abundance of fresh air is a *sine qua non*, and oxygen is worthy of trial.

THE CONTAGIOUS PHASE.—It is customary to regard whooping-cough as especially contagious in its earliest phases, and to consider its liability to spread as practically over when the disease has existed for four weeks, even though the characteristic cough be still present. This view is supported by P. Lereboullet,² who cites the results of extensive research by himself and others, which show that the disease is contagious from its onset. He advises that children who have been exposed to infection should be isolated immediately catarrhal signs develop, and the sputum be examined for the bacillus. There is no reason for keeping the child isolated after four weeks or even less, though the paroxysmal cough be still severe. Five weeks is the extreme limit, and a change of air may safely be recommended then without fear of contagion. The alleged return cases from whooping-cough can always be traced to healthy carriers or to persons having a mild unrecognized infection. By letting the child cough on a Petri dish, the Bordet-Gengou bacillus was found early in the catarrhal stage in 5 of 7 cases and in 27 of another group of 32. In none of the positive cases was the diagnosis certain at the time. Tests of other subjects who did not develop whooping-cough were always negative. In a group of 33 at the second or third week of the disease this test was negative in 9, and also in 9 of the 27 after three or four weeks, and in 66 of 69 who had been coughing for four or five weeks. It was positive only in one between the fifth and sixth weeks.

TREATMENT.—For several years eulogistic articles on the value of **Pertussis Vaccine**, prepared from the Bordet-Gengou bacillus, have appeared in the American press, but for some reason this method of treatment has never been taken up seriously in this country. Paul Luttinger³ again writes in its favour. On a former occasion he described good results from its adoption in 2364 cases; this time he deals with another group of 238 cases seen in private practice. With the exception of 11 very severe cases, where a mixture of sodium bromide and antipyrin was given, the cases received no other medicinal treatment. In 52 cases the vaccine was given as a prophylactic measure, and 42 did not develop the whoop, while 9 suffered from a slight non-paroxysmal cough for about two weeks. Two of the latter began to whoop after two weeks, and were given curative vaccine without effect.

The average duration of 187 cases treated by curative vaccine, including the 11 severe cases, was sixteen days of paroxysmal cough. The usual course is as follows: After the first injection the child is liable to cough more during the following night, but the second night is often the first restful night it has had since the cough began. A few days later the vomiting stops, and after the third injection the whoop usually disappears. In refractory cases six injections are given instead of three. The doses for a child one year old are $\frac{1}{2}$ billion, 1, 2, 4, 8, and 16 billion. The injections are given subcutaneously by a hypodermic syringe, every other day, an interval of five days being allowed between the third and fourth doses. For prophylaxis the first three days suffice.

The results are invariably good, the duration of the paroxysmal cough being shortened to half its average length, the severity of the attacks remarkably reduced, and all complications, including subconjunctival hæmorrhage, are avoided. Among those who have lately reported good results from pertussis vaccine are Goler in 396 cases and Shaw in 112 cases, of which 36 per cent were shortened in duration, 52 per cent had fewer and less severe paroxysms, and 12 per cent were not affected. Bloom reports 40 cases in which the vaccine shortened the duration and severity of the disease and prevented complications. Woloston reports 36 cases, Loge over 100 curative and prophylactic cases, and Cheney states that the disease is shortened from twenty to twenty-five days, and that complications are practically absent. Rosenthal states that pertussis vaccine is satisfactory in 80 to 85 per cent of cases, but doubts its prophylactic value, and Bogert found it a sure preventive in 31 cases. D'Atri, Polozker, and Ivanissevich add their testimony to its value.

T. Bayma⁴ believes, as the result of an experience of hundreds of cases, that vaccines are the most effectual means yet known for treating whooping-cough. He injected the **Antitossina** or autogenous vaccine, using the whole sputum instead of, like Kraus, merely the threads of mucus. Barilari⁵ reports attempts to treat whooping-cough with the patient's own sputum, or with asthma sputum, with an autovaccine, with sputum from healthy persons, and with various preparations. Charts are given showing an abrupt drop in the number of paroxysms after injection of an autovaccine. No effect was obvious in some cases, but on the whole he regards 'antitossina' as efficient. The sputum for its preparation must be from patients not previously treated by it.

A. J. Armando and L. V. Berisso⁶ have administered intramuscular injections of 5 or 10 c.c. of a 100 per cent **Solution of Saccharose** in 20 cases. The first effect noticed was that the nights passed without paroxysms; the number during the day increased at first, but then became milder and less frequent, to disappear altogether after ten or fifteen days. Expectoration ceased after the eighth or tenth day. There were no complications. The duration of the disease was from ten to twenty days.

N. Macleod⁷ advocates **Brushing the Throat** with a **Resorein Solution**. The

instrument employed is a wire-handled throat-brush, bent at first so as to be suitable for pharyngeal use, and later, when tolerance is established, almost to a right angle about $1\frac{1}{2}$ in. from the point, so that it can be used for laryngeal brushing. The resorcin is in 2 per cent solution in glycerin and water, 1 and 12 parts respectively. Immediately before each early application of the brush, the patient is put through a preliminary drill in breathing deeply with the mouth open and the tongue well protruded, to be persisted in while the brush is introduced into and passed quickly around the walls of the pharynx. Mucus should be washed off on withdrawal, and the brush kept in a tablespoonful of the resorcin solution, renewed daily. The procedure is repeated hourly during the waking period. In cases shy of the brush it is helpful at the first performance or two to be satisfied with introducing the brush short of the pharynx until it becomes better tolerated and the sweet taste of the solution is experienced. Gradually introduced further, the brush soon reaches the pharynx, where a single turn round its walls will suffice. No attempt to enter the larynx should be made until the brush is tolerated in the pharynx. One can but agree with his belief that the drug plays no part in the treatment. He claims for this procedure that it produces such amelioration within a week or ten days in cases where paroxysms are violent and frequent, that the disease ceases to cause distress to the patient and anxiety to the parents, and, when applied early in suspicious cases, that it prevents the development of distressing cough and spasm. He ascribes the good effect to the removal of mucus, the lessening of the reflex sensibility, and to some extent to the development of control. Detailed reports of cases are necessary before we can estimate the value of this treatment, which clearly is unsuitable for very young children or for those already greatly exhausted by the disease.

REFERENCES.—¹N. Y. Med. Jour. 1918, ii, 980; ²Paris Méd. 1919, Jan. 9, No. 2, 44, in Jour. Amer. Med. Assoc. 1919, i, 833; ³N. Y. Med. Jour. 1919, i, 322; ⁴Annaes Paulistas de Med. e Cirurg., S. Paulo, 1918, July 9, No. 7, 145, in Jour. Amer. Med. Assoc. 1919, i, 688; ⁵Revista del Instituto Bacteriologico, Buenos Aires, 1918, Aug. 1, No. 4, in Jour. Amer. Med. Assoc. 1919, i, 232; ⁶Revista Sud-Americana de Endocrinologia, etc., Buenos Aires, 1918, Oct. 1, No. 10, 287; in Jour. Amer. Med. Assoc. 1919, i, 461; ⁷Lancet, 1919, i, 254.

WOUNDS. The use of Copper Sulphate in (p. 6).

XANTHOSIS AND XANTHÆMIA.

E. Graham Little, M.D., F.R.C.P.

Salomon,¹ who with van Noorden first described this condition, reverts to its consideration in this interesting paper. Xanthosis is described as causing a canary-yellow pigmentation of the skin, especially of the nasolabial folds, the chin, the mouth, the palms and soles, the fronts of the elbows, and the axillæ. Whereas the earlier observations concerned diabetics almost exclusively, the author's more recent experience demonstrates the existence of a group of cases in which the general health of the patient is quite normal. Investigations as to the nature of the pigmentation have established it as caused by a lipochrome body to which the authors have given the name of lutein, a pigment derived from the blood. Xanthosis cannot exist without xanthæmia, but xanthæmia can exist without xanthosis, and is much more frequent than the latter. The pigmentation may be general, in which event it may be difficult to distinguish this disorder from jaundice. In the latter the colour is usually in later stages a greenish-yellow, not a bright yellow, and the persistence of xanthosis in certain sites of predilection for long periods marks it off from jaundice. There is a noteworthy absence of bile pigments in the urine. The treatment adopted was apparently chiefly dietetic, but is not clearly specified.

REFERENCE.—¹Wien. klin. Woch. 1919, May 8, 495.

YELLOW FEVER.*Sir Leonard Rogers, M.D., F.R.S.*

H. Noguchi^{1,2} records the results of an investigation of yellow fever at Guayaquil, which may prove to be of great importance. By the injection of the blood of cases into guinea-pigs, a rise of temperature occurred after an incubation period, with albumin and casts in the urine. A fall of temperature by lysis soon occurred, followed by jaundice, hæmorrhages from the mucous membranes of the nose, mouth, and gastro-intestinal tract, producing black-vomit-like contents, anuria, and coma, with convulsions in fatal cases. An organism closely resembling the leptospira of infectious jaundice was found in the blood, liver, and kidneys of the infected animals by dark-ground illumination and a similar organism was sometimes found in the blood of patients, and pure cultures were occasionally obtained from the blood of yellow-fever patients, only visible by dark-ground examinations. A series of 18 passages through guinea-pigs has been obtained, which have also been infected with pure cultures of the organism, and the organism again recovered from them in pure culture. Some of the guinea-pigs, which recovered from mild attacks, proved immune to further injections of virulent material. A positive Pfeiffer's reaction was obtained with the organisms and the blood of yellow-fever patients and infected animals. Filtrates through Berkefeld filters V and N of the blood of infected animals produced the disease. If these observations are confirmed, the problem of the etiology of yellow fever will be solved. Some of the guinea-pigs were protected from fatal infection by the serum of convalescent yellow-fever patients.

REFERENCE.—¹*Jour. Amer. Med. Assoc.* 1919, i, 187; ²*Jour. of Exper. Med.* 1919, June 1, 547 and 565, July 1, 1, and Aug. 1, 87.

Part III.—Miscellaneous.

PUBLIC HEALTH ADMINISTRATION :

INCLUDING

- I. MATERNITY AND CHILD WELFARE.
- II. SCHOOL MEDICAL SERVICE.
- III. INFECTIOUS DISEASES PREVENTION
(INCLUDING VENEREAL DISEASES AND TUBERCULOSIS).
- IV. INDUSTRIAL HEALTH.
- V. HOUSING AND RE-HOUSING.
- VI. GENERAL MATTERS (*not included above*).

EDITED BY JOSEPH PRIESTLEY, B.A., M.D., D.P.H.

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Note :—On July 1, 1919, the new Ministry of (Public) Health was born, to take the place in all health matters of the Local Government Board and (in time) of other Government Departments, which are, at present, also engaged, in part, in Public Health administration. The MEDICAL ANNUAL wishes the new Ministry “God speed” ! The work before the Ministry is *colossal*.

I. MATERNITY AND CHILD WELFARE.

WELFARE CENTRES.

Much energy is still being displayed by the Ministry of Health in advancing the cause of maternity and child welfare. The latest phase of such energy is to be found in the Regulations or Memoranda dealing with: (1) Training of health visitors and midwives; (2) Day nurseries; (3) Maternity and infant welfare centres; (4) Maternity homes and hospitals. In connection with (1), the training of health visitors and midwives, the Board of Education is associated with the Ministry of Health. Maternity and infant welfare centres include: (a) Maternity or antenatal centres; and (b) Infant welfare centres. The Ministry of Health lays down in no uncertain language the value of *voluntary* centres, working in conjunction and amalgamation with official (municipal) agencies, and the need for voluntary workers (including working women) as the basis of managing committees of welfare centres, thereby creating an atmosphere of human sympathy and friendship which is eminently desirable—the value of disinterested work of this kind being immeasurable. Voluntary helpers must be competent, must attend regularly, and must have definite simple duties allotted to them—e.g., the keeping of records, preparing babies for weighing, showing model garments and giving simple instructions as to their making, etc. It is clearly the intention of the Ministry of Health that officialdom shall not ride rampant, but shall be restricted to the securing of proper organization and co-ordination and a high standard amongst voluntary associations dealing with the important work of maternity and child welfare—antenatal, natal, and postnatal (or neonatal). Under the Ministry of Health

Act, 1919, central unification of control has been secured by the transference to the Ministry of Health of the powers hitherto exercised by the Local Government Board, the Board of Education, and the Home Office in regard to nursing and expectant mothers, and to children under the age of five years. Local co-ordination is now called for, and to that end the system of 'grants' (both by the Government and by the local sanitary authorities) is valuable. Maternity and infant welfare centres (including antenatal centres) are becoming general all over the country, but what are urgently needed are private or semi-private maternity homes for the reception of the poorer classes—homes wherein mothers can be confined and wherein they can afterwards obtain the necessary mental rest and freedom from domestic worries. At present, confinements take place in crowded and more or less insanitary homes, the routine family life of which still continues—e.g., getting meals for the father and the other children, seeing that the children get to school and are put to bed properly, keeping the house clean, buying provisions, etc.—all of which duties are being carried out downstairs whilst the newly-confined mother is upstairs, hearing every noise and picturing to herself the confusion that must be taking place on account of her inability to get about as usual. How unsatisfactory is all this is well known to workers amongst the poorer classes and amongst the working classes to whom the designation 'poorer' is no longer applicable. Picture an opposite condition of things! The mother's removal to a 'homely' and properly conducted maternity home in the neighbourhood, her confinement there, and the subsequent mental rest and freedom from all domestic worry for (say) a fortnight, with the attendance at her home of a 'home-help' to keep things going whilst mother is away—to see that the husband and also the children get their meals; to wash and dress, and send off tidily to school, children of school age, and to look after them when they return; and to keep the house clean and the young children (not of school age) out of mischief. The picture is an ideal one, but it is not a picture only. Such maternity homes exist, as also do such 'home-helps'; and the gratitude of the fortunate mothers is more than worth the trouble and expense involved (*see* MEDICAL ANNUAL, 1919, p. 482).

An informal conference on 'pediatrics' has recently been held under the chairmanship of the Chief Medical Officer of the Local Government Board (now the Ministry of Health), with the result that certain resolutions were passed, marking time practically, and showing where we are, or ought to be, in regard to the important subject of 'pediatrics', i.e., maternity and child welfare. These resolutions deal with the following matters:—

1. The importance of breast-feeding as superior to artificial feeding in every respect, but the need that exists in breast-feeding as well as in artificial feeding of: (a) Preventing over-feeding; (b) Securing regularity of feeding (4-hourly feeds during the day, with a 7 to 8 hours' interval in the night).

2. The necessity for uniformity of advice officially given by local authorities on the important subject of maternity and child welfare.

3. The desirability of students (medical) being trained in, and taught, as part of the ordinary medical curriculum, the subject of infancy and childhood (both in health and disease).

4. The great need that exists for the proper training in infant welfare of all midwives, and the securing of properly trained midwives for confinement cases.

MIDWIVES.

Regulations have been made in 1919 by the Board of Education for the training of midwives (including regulations for payment of grant in respect of such training), both intending and practising midwives, at recognized residential institutions, of which the premises, equipment, and staff are adequate and suitable for the purpose in the opinion of the Board, and which are recognized for the purposes of the Regulations of the Central Midwives Board. To each institution, there must be attached a responsible body of managers and a person appointed to act as correspondent on behalf of the managers. Further, an institution must not be conducted for private profit or farmed out to any

member or members of the staff, and must be eligible from its character and financial position to receive aid from public funds; whilst no student may be refused admission upon other than reasonable grounds—students paying fees according to scale approved by the Board. Suitable records must be kept, and returns furnished from time to time as required.

Courses of instruction are (1) for intending midwives, (2) for practising midwives; but no student will be taken into account for grant unless either: (a) She has signed an agreement or declaration of bona fide intention to practise as a midwife; or (b) (i) She commenced her training before Oct. 1, 1919, and began to practise as a midwife within three months of the end of her course, or (ii) She has been for not less than three years in full-time employment as a health visitor, or has completed successfully a course of training approved under the Regulations for the training of health visitors.

HEALTH VISITORS.

The Ministry of Health has decided that the health visitor of the future shall go through a course of training, and the Board of Education has issued regulations relating thereto—the full course to be a two years' one, and the theoretical instruction to include elementary physiology, cookery (working class) and household management, elementary economics, social problems, hygiene, infectious diseases, maternity and child welfare, etc. Practical training is to be given also, illustrating the theoretical instruction and giving a first-hand personal knowledge of the various aspects of future work—such practical training to occupy one-half of the student's time. A one-year course only is necessary for a hospital nurse (three years' training), a health visitor (with three years' service), or a graduate of a university. A student must be at least 18 years of age before entering upon a course of training, and, if qualified at 20 years of age, it is suggested that she should take a further course of training—e.g., C.M.B. certificate—or act as a voluntary worker at a welfare centre, having regard to the fact that health visitors are rarely selected by local authorities from women under 25 years of age.

THE MILK ORDERS.

The Milk (Mothers and Children) Order, 1918, was issued by the Food Controller on Feb. 8, 1918, under the Defence of the Realm Regulations, and the Local Authorities (Food Control) Order (No. 1), 1918, was issued by the Local Government Board on the same date, and much good has accrued therefrom—commensurate with the energy and sympathy with which sanitary authorities have put such Orders into force. *Necessitous* mothers (expectant and nursing) and *necessitous* children (under 5 years of age) were alone eligible, and the onus of deciding as to the 'necessitousness' was thrown upon the medical officers of health or upon the medical officers of the various welfare centres. The sanitary authorities have to refund all monies expended for the milk. A year's working of the Orders, assisted by the present high price of milk, has satisfied the Ministry of Health that the limiting of the orders to *necessitous* cases has prevented, and is still preventing, much of the value of the Orders. The Ministry has, consequently, issued an amending Order, withdrawing this restriction and making the milk now available for all mothers and children for whom the medical officers certify such milk to be required. Administration of the Orders is thereby much simplified, the somewhat arbitrary definitions of 'necessitousness', as laid down in some instances, being done away with. The maximum quantity of milk allowed *daily* is $1\frac{1}{2}$ pints for children under $1\frac{1}{2}$ years of age, 1 pint for children between $1\frac{1}{2}$ and 5 years old, and 'as ordered' for mothers (expectant or nursing). The Orders (as amended) will go far to prevent the ill-effects prophesied as the result of the present high price of milk, provided, of course, the Orders are energetically and enthusiastically administered by local authorities. The milk is to be supplied free or at a reduced rate (under cost price) to those who, while not 'necessitous' in the narrow sense of the word, are yet unable, because of the ruling price of the commodity, to

obtain supplies which may be considered adequate from the standpoint of national health. The amending Order must have far-reaching effects, and must save many thousands of lives and prevent many tens of thousands of illnesses known as deficiency illnesses (the direct results of improper feeding) amongst infants and young children. The Premier promises also a Milk Municipalization Bill, which, if carried, must also help to protect the young life of the country. There is little doubt but that the cry of "Save the children" is the first and chief plank in health administration at the present time, and many thousands of health visitors and voluntary workers will be added in the near future to the staffs of sanitary authorities (directly or indirectly).

As to the quality or cleanliness of the milk to be supplied under the Orders, nothing is said, and matters are *in statu quo*. The present price of milk is the price that it was stated would have to be paid for customers demanding first-grade milk. Dirty milk is still the rule, though the loss to the trade due to dirty milk is admitted. Every care should be taken to ensure cleanliness at the point of production of milk, requiring knowledge of scientific and bacteriological farming, and money for the installing of the necessary appliances. With guaranteed purity at the source, other points of probable contamination of the milk *en route* to the consumer become negligible—at least, practically so. With contamination at the outset, no subsequent processes of cooling, U-lax filtering, etc., are of use. The educated farmers ought to notice that milk cleanly produced is economically an asset to the trade, and that the cost of such production will be repaid by absence of loss at the point of distribution.

II. SCHOOL MEDICAL SERVICE.

MEDICAL INSPECTION OF SCHOOL CHILDREN.

Probably no branch of the Health Service has suffered more as the direct result of the War than the medical inspection of school children. School medical officers have been released by their authorities for service with the forces, and the number of inspections of school children has been lessened accordingly, as also the amount of school children medical treatment. Most authorities have had to be content with marking time, or preparing plans for energetic work when the War should be over. Meanwhile, under the Ministry of Health Act, the powers and duties of the Board of Education with respect to the medical inspection and treatment of school children have been transferred to the Ministry of Health under an Order in Council dated Nov. 25, 1919 (the actual transference coming into operation on Dec. 1, 1919), but with the proviso that the Board of Education will still be responsible for receiving and approving all schemes of local education authorities, and for the payment of grants in aid of medical inspection and treatment, and the officers of that Board will continue to carry on the work of inspection. The Board of Education will be acting in this matter under, or on behalf of, the Ministry of Health, which will retain the right to settle the nature of the work of medical school inspection and treatment and the standards of such work. The transference, therefore, is only a *part* transference, to be completed, doubtlessly, at a future date.

III. INFECTIOUS DISEASES PREVENTION.

INFLUENZA.

The serious and widespread epidemic, or rather pandemic, of influenza, which occurred during 1918-19, drew the world's attention to the disease and the excessive morbidity and mortality to which it gave rise. Various additional statistics have been issued since the MEDICAL ANNUAL, 1919, was published (see pp. 482-484), dealing with the disease in various countries and in various towns and districts; but all such statistics, on analysis, go to show that the disease was *ubiquitous*, presenting practically the same features and the same administrative difficulties in connection with its prevention. Taking the

administrative area controlled officially by the writer of this article, the statistics tabulated are fairly characteristic and may be set out. *One-sixth* of the total deaths for twelve months were registered as due to the disease, and *one-third* of the total morbidity was roughly estimated as due to the same cause. The highest mortality was in the age-period 25 to 40 years, whilst the age-periods 45 to 60 years and over 60 years also suffered severely. Childhood suffered but slightly, and infants under 12 months were practically exempt. The sexes suffered equally. The disease was not confined to the congested and crowded districts, and insanitary conditions did not appear to have any direct *causal* relationship with its incidence. The forms in which the disease was met with were three (as already stated in the MEDICAL ANNUAL, 1919, p. 484)—(a) nervous, (b) catarrhal (bronchitis and pneumonia), and (c) gastric, but the catarrhal form was the commonest. Pfeiffer's bacillus was met with, as also were the pneumococcus and the streptococcus, separately or together. Mixed vaccines gave the best results, though the consensus of expert opinion is doubtful as to the value of vaccine therapy in this disease—at least at present. Deaths were chiefly due to pneumonia, which often appeared as the initial, and not as a subsequent, complication, owing, apparently, to direct infection of the lung tissue by the bacillus as soon as it had gained entrance into the blood and set up the influenzal fermentation or zymosis. Second attacks were few, and infection was at its height during the first few hours of the disease, being spread directly from person to person, as shown by the many instances in which several members of the same family or of the same household were affected at the same time, as well as many persons working together in the same business premises, factory or workshop, or work place. Immunity from the disease by a previous attack appeared to last for a few months only—certainly not over a year.

The disease is not yet compulsorily notifiable, but its pneumonic form (acute influenzal pneumonia) has recently been made so. Public preventive measures are difficult to administer, as shown by the revocation of the Public Health (Influenza) Regulations, 1918. These administrative difficulties may be exemplified as follows: When were the Regulations to be administered in a district? How many known cases of influenza constituted an epidemic? Was an epidemic precedent to the Regulations at all? What was 'effectual and thorough ventilation'? Could such be carried out in a place of entertainment whilst the audiences remained indoors, or were the room or rooms to be cleared first and the people to be kept standing outside in the damp or rain or sleet or snow? The proprietors of cinematograph exhibitions were naturally up in arms, chiefly on account of the varied requirements of different local authorities. The question of preventing the entrance of the disease into a country is an important governmental administrative preventive measure, and great care should accordingly be taken internationally.

Apart from this wide question, what is a sanitary authority to do if and when an epidemic of influenza is threatened, *as shown by the returns from compulsory notification*? (1) Education of the people in simple preventive home methods of isolation and treatment (nursing), with official staffs of nurses and medical men available as required; (2) Hospital isolation ready for such cases as may require it, e.g., patients living in common lodging-houses, colleges and boarding schools, or any houses wherein congregate, for living and sleeping, large numbers of inmates; (3) Official disinfection, though the simplest disinfection is required, as the infective virus is probably unstable and evanescent, and is readily destroyed by ventilation methods and the flushing out of infected rooms with daylight.

As to what the infecting germ really is and what its biology is, there is much yet to be discovered, in the same way as there is much to be explained as to why a mixed infection of influenzal virus (whatever it is) and streptococcus (haemolyticus) makes such a virulent mixture. All this is interesting bacteriologically and important, but, until these further discoveries are made, sanitary authorities must be ready to do what they can—as soon as an epidemic begins. Much must be left to the individual and the medical attendant (if any), but the individual must be told officially what is expected of him or her.

The educational side of preventive measures was met by the authoritative statement on influenza by the Royal College of Physicians of London, which was issued under date of November, 1918, and adopted officially by the Local Government Board (now the Ministry of Health) and circulated as such amongst medical officers of health. The Press generally helped considerably in this connection—a very important work. People must be educated in the simple preventive measures which obtain, or should obtain, in connection with influenza. Isolation in bed, warmth, and proper nursing are a *sine qua non*; and, in regard to the last-named, sanitary authorities should arrange for free nursing at the homes of the people, as required, by health visitors or nurses, officially appointed by the sanitary authorities or arranged for through local nursing associations.

The compulsory notification of the disease is essential, as, indeed, is the case in all infectious diseases. Without the knowledge as to where the disease is lurking, preventive measures cannot be taken. It is true that the short incubation of the disease and the rapidity with which it spreads appear to detract somewhat from the advantages to be derived from notification, as does also the practical difficulty in securing sufficient hospital accommodation during epidemic times. The same arguments apply to measles, cholera, plague, etc., diseases which also spread rapidly. Home isolation and nursing (especially the latter) are important preventive measures in connection with diseases such as influenza and measles, and notification of these diseases is therefore the first preventive measure.

MEASLES AND GERMAN MEASLES.

The Ministry of Health has thought fit to issue an Order rescinding (as from Jan. 1, 1920) the Public Health (Measles and German Measles) Regulations, 1915, under which the two named diseases were compulsorily notifiable by the parent or guardian on the one hand and by the medical practitioner on the other hand—the latter being restricted to the notification of *first* cases only and not any second cases occurring within the same households within two months.

Compulsory notification of an infectious disease is certainly the first step in preventive measures, so that public authorities may know where the disease is lurking, or where the disease has broken out. Without that preliminary knowledge, it is difficult to see how preventive measures can be taken in the way of isolation, disinfection, nursing, etc. It is true that, in the cases of measles and German measles, the diseases spread with great rapidity in the early stages (before, indeed, a diagnosis is made), and it is equally true that administrative difficulties arise as to hospital isolation in epidemic times; but, none the less, these difficulties were fully considered when the compulsory Order was made four years ago, and it is to be regretted, in the opinion of some, that compulsory notification has been revoked, more especially having regard to the fact that administrative machinery has been put into working order by many local authorities and, in very many districts, is working smoothly *with most satisfactory results*. Is all this machinery to be scrapped? Fortunately, the new rescission Order does not preclude a local authority from seeking, and it is to be hoped obtaining, permission from the Ministry of Health to maintain compulsory notification of measles and German measles in force (see Section 3 of the Order). Local authorities, with the necessary administrative machinery installed and at work, will do well to make the necessary applications forthwith: otherwise, the medical practitioners within their respective districts will cease to notify, and the valuable nursing (home nursing) arrangements will be of no use, and other preventive or remedial measures rendered valueless. It is satisfactory to learn that the Ministry of Health is alive to the ravages wrought by measles amongst young children, and the urgent need that consequently exists for preventive measures of a stringent character being taken. The Ministry suggests, however, the following measures: instruction of parents and guardians by formal and informal lectures by the medical officer of health or medical practitioners, and by the assistance and advice of health visitors; home nursing by nurses under the control of

the local authorities; hospital isolation and treatment only in severe and complicated cases, etc. The outstanding fact still remains that knowledge as to where the disease exists is absolutely necessary in the first instance, and this knowledge is best obtained through compulsory notification, despite the comparatively large cost involved. Such, however, as stated above, is not, apparently and unfortunately, the opinion of the Ministry at the present time.

VENEREAL DISEASES.

The battle is raging about the question of preventive self-protection or self-disinfection of the individual—the so-called ‘packet system’—moral propaganda versus practical methods. With human nature what it is, how can there be any difference of opinion? Self-continnence is the *ideal*, but how to attain it? Cinematograph displays of the ravages of the disease will not alter human nature. An antidote within an hour after exposure will prove successful—properly applied, of course. Prevention is better than cure. According to the Society for the Prevention of Venereal Disease, the best antidotes are 1-1000 solution of potassium permanganate (one 5-gr. tablet in half a pint of water) and 33 per cent calomel ointment (3 parts calomel, 4 parts lanolin (hydrous), 2 parts white vaseline)—both to be used if possible at once, together—the former within one hour and the latter within six hours of exposure to risk. The proper application of these antidotes is only guaranteed in the case of the male. How best to self-protect or self-disinfect the female has yet to be discovered. The dire after-effects of the disease more than justify such preventive measures being taken by the individual. At the same time, no one will dissent from all the recent official pronouncements of the Interdepartmental Committee on Infectious Diseases in connection with Demobilization, in its interim report to the Minister of Health on the prophylaxis of venereal diseases, with special reference to the use by the civil community of the ‘packet system’, to be officially encouraged by the Government. The finding of the Committee on the general question of venereal disease prevention is as follows: The true safeguard is individual continence and a high standard of moral life—this moral factor being too often neglected. The detailed conclusions are as follow:—

1. That certain drugs, if properly applied, are efficacious in preventing venereal disease.
2. That, if these drugs are not properly or skilfully applied, their efficacy cannot be relied upon.
3. That the issue of prophylactic ‘packets’ tends to give rise to a false sense of security, and thus to encourage the taking of risks which would not be otherwise incurred, and the neglect of facilities for early treatment when available; and, in certain circumstances, *might* even increase the spread of disease.
4. That, in spite of the most careful instructions, the grant or issue of ‘packets’ results in many an individual using them for self-treatment after he finds himself infected. They are not intended for this purpose, and are ineffective when so used. Drugs which are credited with the power of preventing diseases are very frequently accepted by the public as useful in their treatment. Their use for the treatment of developed disease may be definitely harmful, since they delay diagnosis and the application of proper treatment at a time when promptitude is of the very first importance for its success.
5. That, where preventive treatment is provided by a skilled attendant after exposure to infection, the results are better than when the same measures are taken by the individual affected, even after the most careful instruction.
6. That the excessive consumption of alcoholic liquors not only diminishes the sense of responsibility, but also tends to prevent the proper use of prophylactics and to delay the individual’s application for skilled treatment.
7. That the most carefully organized ‘packet’ system, such as exists now in the Army (a system which would be unattainable in the civil community), has not produced such a general reduction in the incidence of venereal disease as to counteract the disadvantages mentioned in these conclusions.
8. That the organization of recreation and social amenities has assisted in

the reduction of the incidence of venereal diseases in the Services before the War, and has also assisted in preventing that increase in the incidence of these diseases which, from past experience, might have been anticipated during the War.

9. That energy should not be dissipated on measures of doubtful value, but concentrated rather on wise propaganda and the provision of early, prompt, and skilled treatment in order to diminish the prevalence of these diseases. It should be recognized that failure to cure these diseases is one of the main causes of their prevalence, and that failure to cure, in the most skilled hands, results largely from failure to treat them in their early stages.

TUBERCULOSIS.

Treatment in a sanatorium or hospital is not the end of the tuberculosis question. It might more fitly be described as the beginning. After sanatorium or hospital treatment comes 'after-care', a most important branch of the prevention of tuberculosis. Residence in a sanatorium is simply a stage in treatment, and the same remark applies to residence in a hospital. A sanatorium and a hospital are not the same thing, though in the lay mind, and even at times in the official mind, they are. Originally, sanatoria were meant to be institutions for the open-air treatment of tuberculosis, to *arrest*, if not cure, the disease; and for that purpose residence for a lengthened period (certainly more than three months, as a rule) therein is necessary. Early cases—very early cases—alone are eligible for sanatorium treatment, at least with any prospect of permanent success. Large numbers of sanatoria are consequently required, and this need is exaggerated having regard to the fact that, during the War, sanatorium building ceased, and even now, the War over, the scarcity and high prices of labour and materials (including fittings and furniture) are such as will prevent buildings for sanatorium purposes being erected by local authorities. After sanatorium or hospital treatment, as already stated, comes 'after-care', to ensure that the utmost possible permanence of good results follows with the following on of training colonies, where new occupations are to be carried out by tuberculous persons under open-air conditions—such occupations in no wise to be limited to agriculture or farming, but to include all sorts and conditions of trades. A farm colony is the natural and scientific advance from a sanatorium, ensuring the beneficial results obtained in the latter being increased and rendered permanent in the former. Prolonged treatment is necessary in a farm colony. Beyond the farm colony is the village settlement for tuberculous persons, where they can carry out their new trades under suitable conditions. It is all so simple *in theory*. The near future will, also, see such schemes carried out in practice, a start having already been made in that direction. The question of dealing with the 'dependents' of the inmates of a farm colony is a difficult one economically, and this difficulty is preventing many suitable cases from taking advantage of the colony schemes.

'After-care' work is not limited to the provision of farm colonies and village settlements. On the contrary, all tuberculosis patients require looking after, so as to ensure them having suitable environments and conforming to certain well-known hygienic rules of life, which are directly beneficial to the patients themselves as well as indirectly beneficial to their relatives and friends. Under simple precautionary measures, the danger of infection spreading personally from one to another is practically negligible. 'After-cure' also includes arranging for institutional treatment, whenever such becomes necessary in the opinion of the tuberculosis medical officers concerned.

NOTIFIABLE INFECTIOUS DISEASES.

As the first stage towards taking preventive measures is compulsory notification of an infectious disease, the tendency is for the list of such compulsorily notifiable diseases to increase. The Public Health (Pneumonia, Malaria, Dysentery, etc.) Regulations, 1919, make compulsorily notifiable pneumonia (acute primary and acute influenzal), malaria, dysentery (amœbic and bacillary), trench fever, and paratyphoid fever (as a form of 'enteric fever'). The Regulations

came into force on March 1, 1919. In the case of pneumonias, the object of notification is to secure proper nursing as well as investigation of the conditions under which the diseases have been contracted. In the case of malaria, trench fever, or dysentery, the medical officer of health must secure treatment of the case in a suitable hospital or at the patient's own home; and, when the trench fever or the dysentery or the malaria is contracted in the United Kingdom, the medical officer of health must forward the names and addresses of the patients to the Ministry of Health. Preventive measures to be taken by the medical officer of health are set out in the Regulations.

The Ministry of Health has decided to extend the operation of the Public Health (Acute Encephalitis Lethargica and Acute Polio-encephalitis) Regulations, 1918, and to continue them in force until the Ministry otherwise directs. The 1918 Regulations had reference to the year 1919 only, making the two diseases compulsorily notifiable throughout England and Wales.

Fees for Infectious Diseases Notification.—The payment of the 2s. 6d. notification fee (private cases) was to be resumed on the termination of the War—a date to be fixed by Order in Council. The reduction of the fee from 2s. 6d. to 1s. was made under the Local Government (Emergency Provisions) Act, 1916, Section 5 (a), which was, by Section 24 (2), to have effect only during the continuance of the War, and afterwards for such period or periods (if any) as might be fixed by the Local Government Board (now the Ministry of Health)—a period not to exceed one year. As is well known, there is a penalty attaching to neglect to notify, and the fact has been brought home to a medical man recently by the infliction upon him of a fine of £50 for not notifying a case of ophthalmia neonatorum under the Public Health (Ophthalmia Neonatorum) Regulations, 1914, Article V. The evidence submitted to the magistrate was alleged neglect that had actually, so it was stated, caused the child's blindness. The Regulations are made under powers conferred by the Public Health Acts, and under such (and other) Regulations the maximum penalty is £100.

Infectious Diseases at present Notifiable.—It may be useful to put on record a complete list of infectious diseases that are *generally* (i.e., in all districts) compulsorily notifiable, as follows: small-pox, cholera, diphtheria, membranous croup, erysipelas, scarlatina or scarlet fever, typhus, typhoid, paratyphoid, enteric, relapsing, continued, puerperal fever, plague, glanders, anthrax, hydrophobia, epidemic cerebrospinal meningitis or 'spotted' fever (including post-basis meningitis), ophthalmia neonatorum, acute poliomyelitis or acute polio-encephalitis, tuberculous, encephalitis lethargica, malaria, dysentery (amoebic and bacillary), trench fever, and pneumonia (acute primary and acute influenzal).

IV. INDUSTRIAL HEALTH.

An increase in the ordinary hours of work does not mean an increased production. Rather is the opposite the truth—i.e., to secure increased production, the hours of labour must be lessened and the comfort and welfare of the workers studied and looked after. Welfare supervision is specially important in the way of the provision of rest rooms in factories for young female workers. There has been a substantial drop in the number of working hours—viz., 58 to 48 hours per week and even less, obtained by the introduction of the following systems: (1) One-break day system; (2) Two day-shift system; and (3) Five-day week system (Saturdays off-days). The Industrial Fatigue Research Board has arrived at the same conclusions, as shown by the experiments made with women workers in shell-making (rough forging). The average hours worked were 55·85 a week (long shift) and 35·65 a week (short shift), and the average outputs per worker per hour were respectively 8·17 (long shift) and 8·70 (short shift). A low efficiency in the last hour of the long shift was noticed, whereas such was not the case in the last hour of the short shift: indeed, in some instances of the latter there was an entire absence of any falling off in efficiency. No differences were noted in night as compared with day work. Similar experiments in the tin-plate industry show increased output with shorter hours and better ventilation.

With regard to one particular disease (tuberculosis), the general conclusion is apparently warranted that the incidence of pulmonary tuberculosis upon the employees in particular trades is higher than can readily be accounted for by the hypothesis that such trades attract persons of inferior physique and low resistance power, and higher than what was to be expected from the ordinary lowered vitality and general unfitness due to bad home conditions. Since the outbreak of the War, the proportionate mortality from pulmonary tuberculosis in women between 15 and 45 years of age has increased in most registration centres, and especially so in women between 15 and 20 years of age in large industrial towns. Aggregation of the workers and food-rations have also played a more or less important part in causing this so-called 'industrial rise' in pulmonary tuberculosis amongst certain trades employees; but there seems still to be a balance left that can only be satisfactorily explained as being due to 'industrialism'.

Second only, if not equal, in importance to lessened hours of work is the provision of works canteens, where good food, properly cooked and cleanly served, is obtainable by the workers. In this way, greater output and more satisfactory work generally are secured.

Welfare work in factories (including medical supervision) is working wonders, the provision of day nurseries or crèches for the babies of working women being specially useful, when such institutions are so near to the mothers' working places as to ensure breast-feeding of the babies concerned.

V. HOUSING AND RE-HOUSING.

The housing question is well to the front. The Ministry of Health has appointed a large administrative staff, both central and local, and local authorities have prepared or are preparing thousands of schemes for their different districts. The scarcity of building materials (and their high prices), and the difficulties in obtaining labour (and its high price also), still block the way to any satisfactory headway being made—at least for the present. Private enterprise is shy—apparently frightened, despite the Government 'doles' that are offered as incentives. The speculative builder is *non est*. What the final result will be remains to be seen.

That there is a scarcity of houses no one will gainsay; but that the scarcity is entirely the outcome and result of the War is a matter for argument. The standard of housing demanded is higher, and thousands and thousands of persons are waiting to give up their present dwellings and to move into the model cottages or maisonnettes that are, it is expected, to be built all over the country. Slums are condemned by all—officially and otherwise—but the slummy areas cannot be cleared until the people living in the houses have other dwellings to go to.

The net result of all these adverse conditions is that the housing question will take many years to solve: no really forward move can be made in a hurry in the way either of reconstructing large houses into separate contained flats or of erecting new houses. A useful step has been taken by the Ministry of Health in calling upon local authorities to prepare and complete their schemes or forms of survey of housing needs, which under Section 1 of the Housing, Town Planning, etc., Act, 1919, had to be sent in to the Ministry for approval on or before Oct. 31, 1919. These surveys will be the basis of the national housing programme. Large schemes of improvement and reconstruction must necessarily stand over until new houses are built, and consequently houses that are at present unfit for habitation must remain inhabited for the time being. However, the surveys have been made and the plans of campaigns mapped out, to be put into action at some future date, more or less remote. The housing question is aptly described as a national one, and must have far-reaching effects. Local authorities must tend towards the *ideal*, if only as an example to private builders when they begin building again. Tenants will demand higher standards of living and environment, and the Housing Acts, if properly enforced, should go a long way to secure these higher standards being attained, and future generations seeing transformations of existing unsatis-

factory conditions. The *personal* factor must not be forgotten in so far as tenants are concerned. Some tenants will always render insanitary the dwellings in which they live, and it may be that they will have to be catered for specially and looked after by local authorities. The so-called submerged tenth has always been a difficult class to deal with. Education may result in this submerged tenth becoming the submerged hundredth or the submerged thousandth. Even health officials at times give rein to their imaginations!

All are agreed that bad housing has a deteriorating effect on the health of the people; all are agreed, too, as to the essential principles of housing, environmental and general, and the need that exists for systematic town planning. Suitable sites, proper ventilation and natural lighting, efficient drainage and modern sanitary fittings, good inside water supplies, absence of damp, sufficient air and floor space, appliances that prevent or lessen drudgery and housework, etc., may be mentioned as essential principles for all houses and premises, whether to be used as dwelling-houses, work-places, or other purposes. Windows that open and fireplaces fitted with open chimneys are a *sine qua non*, as are also baths, deep washing sinks, larders, cookers, and coal stores (sufficiently large to store 1 ton of coal). All dry conservancy systems of sewage and refuse removal are to go, and the water-carriage system is to be substituted in lieu thereof, subject, of course, to a proper and sufficient water-supply and an efficient system of drains and sewers.

Transit facilities are an important subsidiary branch of the housing question, as the tendency is to live on the outskirts of crowded districts away from work.

The actual materials to be used for buildings are a minor consideration. So long as a dwelling-house is weather-proof and damp-proof, that is all that is required *qua* the building itself, and it is a matter of little concern whether bricks, wood, concrete, or even other materials are used. An ill-ventilated room is no longer regarded as dangerous or injurious to health by virtue of the amount of CO₂ or organic vapours that it contains: it is a matter of air-stagnation and heat, and consequent inadequate cooling power and refreshing effect on the skin (by movement), together with the greater power that infection has of spreading from person to person under such stagnant and heated conditions. The air must be cool and moving. By-laws are being relaxed (even the intercepting trap to the house drain is being done away with, with the assent of the Ministry of Health) to facilitate local authorities' building schemes being carried through. Employers and employees in the building trade have agreed to co-operate, and the Government has promised to release all building materials—but when?—and is now, as a grand finale, offering a 'dole' of £150 per house built to the satisfaction of the Ministry of Health (Housing Department), to "all and sundry", doubtless with a view to drawing in private enterprise.

Nine-inch brick solid external walls are not sufficient to resist damp in all cases, and require in addition to be protected by rough-cast on the outside as a protection against driving rains. The alternative is a hollow 4½-inch brick wall properly bonded—at a greater expense.

Each house or dwelling must be separately contained, with separate living and sleeping accommodation, separate w.c., and separate sink (deep sink).

VI. GENERAL MATTERS.

RAT INFESTATION.

The Rat Orders, the Rats and Mice Act, etc., have done much to emphasize the real damage—damage to foodstuffs, etc., and damage to health—that rats actually do. Various figures have been officially quoted, but the following may suffice as a fair example: Yearly loss in damage to property and foodstuffs, £45,000,000. Plague and other infectious diseases are undoubtedly transmitted from person to person through the medium of rats. Systematic measures must be taken to destroy the animals, and for that purpose the Board of Agriculture and Fisheries is using its best endeavours to stimulate local authorities, which are not alone to blame, private owners and occupiers of premises being also respon-

sible for the damage done. Many rat poisons have been introduced with more or less success, but officially praise is given to barium carbonate and squills. Baits should be of a greyish colour, smelling of aniseed or other similar odour, with a mixture of oatmeal or other cereal and dripping or margarine. The names of commercial poisons may be mentioned as follows: 'Ratin' (bacteriological), 'Danyusz Virus' (bacteriological), 'Londovus' ('Ratto'), 'Rami', 'Danzo' rat killer, 'Rat-Quit', 'Rodine', and many others.

Intensive rat destruction is aimed at, and hence the introduction of the 'rat weeks'. The entry of rats into the country from ships in harbours and docks from overseas must be prevented, and all buildings used as food stores should be rat-proofed. Defective drains and sewers, refuse accumulations, etc., are the chief sources of rat infestation.

IMPORTANT MEDICO-LEGAL CASES.

Workmen's Compensation Act.—A certifying surgeon under the Factory and Workshops Act, 1901, need not concern himself with the nature of a workman's employment in the case of such workman being found to be suffering from a disease which has been scheduled to the Workmen's Compensation Act (Court of Appeal, *Wilson v. Blyth Shipping and Dry Docks Company Limited*—the particular disease in question being subcutaneous cellulitis of the hand, known as 'beat hand'). In other words, Subsection 1 of Section 8 of the Workmen's Compensation Act, 1906, is of universal application, and the description of a disease (scheduled to the Act) is not limited to its occurrence in persons engaged in a particular process.

Compulsory Notification of Tar Cancer and Chrome Ulceration.—The Home Office has issued an Order making compulsorily notifiable by medical practitioners to the Chief Inspector of Factories, under the Factory and Workshops Act, the following diseases, *if contracted in a workshop*: (a) Epithelioma due to tar, pitch, bitumen, mineral oil, paraffin, or any compound, product, or residue of any of these substances; (b) Chrome ulceration due to chromic acid or bichromate of potassium, sodium, or ammonium, or any preparation of these substances. It will be noted in connection with (a) that *epithelioma* alone is notifiable, and not the many other skin diseases that may be precursors of an epitheliomatous condition, e.g., warts, chronic tar ulcerations, etc.

THE EDITOR'S TABLE.

Samples (not returnable) and particulars for this section should be sent to The Editor, 'Medical Annual' Offices, Stondridge, Bristol, on or before November 25.

We are anxious to express no opinion except as a result of practical knowledge, and it is owing to this fact that a notice in the MEDICAL ANNUAL has come to be valued.

NEW PHARMACEUTICAL PRODUCTS AND DIETETIC ARTICLES.

We are always ready, when a sufficient quantity is sent to us EARLY IN THE YEAR, to arrange for these to be tested in hospital practice and reported upon; under other circumstances our knowledge is necessarily more limited; but frequently the simple information as to where a particular preparation can be obtained is all the practitioner requires.

NEW MEDICAL INSTRUMENTS AND APPLIANCES.

We give Inventors and Manufacturers the opportunity of bringing their work before our readers entirely free of cost to themselves, subject only to the following conditions:—

(1) Each article sent for notice must have the novelty or improvement claimed for it clearly stated upon a SEPARATE sheet or sheets of paper. This should have attached to it any illustration (WHICH MUST BE SMALL) for which insertion is desired, and also bear the maker's name. The attention of firms who send a large number of articles for notice is particularly directed to the above condition, as each article has to be sorted into its proper department before it can be considered.

(2) Medical Inventors should merely describe the instrument or appliance, and avoid giving technique of operations.

The Editor is not able to accept reference to circulars, catalogues, or literature as a compliance with these conditions.

PROGRESS OF PHARMACY, DIETETICS, Etc.

Anti-Influenza Vaccine (Mixed).—In addition to the simple influenza bacillus vaccine, for some time offered as a means of treating infections by that microbe, the St. Mary's Hospital Department for Therapeutic Inoculation now supplies through Parke, Davis & Co. a combined vaccine for use as a prophylactic of epidemic influenza and its complications.

Each c.c. of the vaccine contains:—

B. influenza (Pfeiffer)	500 millions.
Pneumococcus (mixed types)	1000 „
Streptococcus	100 „

It is recommended that at least two doses, respectively 0.5 and 1 c.c., should be given at an interval of seven days, and the second dose may advantageously be repeated after another week's interval. For children the above doses should be reduced according to age. The Hospital also prepares anti-influenza vaccine according to the Army formula, and mixed influenza vaccine according to Dr. Wynn's formula.

These vaccines are supplied in ampoules of 1 c.c. and in rubber-capped bottles of 25 c.c.

Apothesine.—This new local anæsthetic is a synthetic compound—the hydrochloride of gamma-diethyl-amino-propyl-cinnamate—which when injected hypodermically has the same effect on the peripheral sensory nerves as cocaine has. As with other synthetic analgesics this effect is produced somewhat more slowly than is the case with cocaine, but when fully developed it is quite as profound and more lasting.

Apothesine is far less toxic than cocaine, it is not a local poison, and it does not cause local irritation, so that primary wound-healing is not interfered with.

In general surgical work, apotesine is used in solutions of from 0.25 per cent to 2 per cent in strength. It is desirable to allow 10 minutes to elapse after infiltration before making an incision in order that analgesia may be complete. Apotesine has been used with very satisfactory results in a large variety of operations, including amputations, Cæsarian section, cystotomy, herniotomy, hysterectomy, turbinectomy, etc. It is the best local anæsthetic available for dental operations.

Apothesine is supplied by Parke, Davis & Co. in tablets, either with or without adrenalin, which are convenient for preparing small quantities of any strength of solution desired. A ready-prepared apothessine with adrenalin solution is supplied in bottles of one fluid ounce and in ampoules of 1 c.c.

Aspirin.—The fact that the word 'Aspirin' is a voided trade-mark, has permitted many preparations bearing the name to be imported into this country which are not up to the standard of the acetyl-salicylic acid of the B.P., and which cause irritation and secondary results. The preparation of acetyl-salicylic acid produced by Menley & James Ltd. is above the standard of the B.P., and has a much higher melting point. It is a preparation upon which absolute reliance can be placed.

Bacteriological Peptone.—This is prepared by Parke, Davis & Co. in fine powder form, readily and clearly soluble in water or infusions, suitable for use in all culture media where peptone is employed. It is manufactured with scrupulous precautions for ensuring a uniform product with a maximum of desirable amino-acids and a minimum of mineral matter. It is rigorously tested as to its perfect suitability for use in bacteriological cultures.

Bacterol.—A very practicable and pleasant antiseptic and germicide manufactured by Menley & James Ltd. It is based upon infusions of eucalyptus and Alpine peppermint combined with formaldehyde and iodine at high temperatures. It is perfectly miscible with water in all proportions, and is not irritating or corrosive. It neither roughens the skin nor attacks instruments. It has a high potency, as solutions of 1-10,000 inhibit growth in broth media. It is usually employed in strengths of 1-500 or 1-1000, and is therefore inexpensive in use.

It is issued in five types, for medical, general, and veterinary purposes, and also in two forms—'Vaporizing', for disinfection of rooms and bedding, and 'Aeriform', for inhalation in cases of hay fever, influenza, and catarrh.

Its non-toxic character and its freedom from injuring or staining anything with which it comes in contact, makes it an ideal antiseptic for all purposes.

Balmosa.—This is a combination of methyl salicylate with sorbefacients, having a non-greasy basis, and for this reason it is to be preferred to many of the applications for the relief of rheumatism, sciatica, etc. (Oppenheimer, Son & Co. Ltd.)

Benzoic Acids and the Benzoates.—These are now manufactured in this country by Menley and James Ltd., and are in every way worthy of the high reputation of the firm. The preparations made are: benzoic acid, sodium benzoate, lithium benzoate, and ammonium benzoate.

Calcium Iodide.—This salt has obtained some reputation for the cure of chronic ulcers of the leg, and also in varicose ulcers. It is a difficult remedy to dispense, both on account of its taste and its deliquescent properties. The 'Pulverette' (gr. v) put up by Oppenheimer, Son & Co. Ltd., is perhaps the best form of administration.

Calcium Lactate.—This is preferred to the chloride in cases where we desire to increase the coagulability of the blood. It is now prepared as a 'Palatinoid' (gr. v) by Oppenheimer, Son & Co. Ltd., and this is a convenient way of prescribing it, as it is somewhat unpalatable in solution. It should be followed by a good draught of water.

Capsoterm.—Under this name Oppenheimer, Son & Co. Ltd. put up a capsicum wool with an impermeable backing, which aids its efficiency and convenience in use.

Digalen Granules.—This valuable and reliable heart-tonic is now put up in granule form, one granule corresponding to $\frac{1}{2}$ c.c. of the solution. They are mechanically prepared without any mass excipient, and the accuracy of dosage is assured. They are rapidly absorbed and quick in action. (The Hoffmann-La Roche Chemical Works Ltd.)

Digitalis Fol. Pulv.—The attention of the profession has been called to the great efficacy of folia digitalis in mitral incompetence. It is claimed that better results are obtained with only $\frac{1}{2}$ -gr. doses than with the ordinary preparations.

Messrs. Oppenheimer, Son & Co. Ltd. have put this up in the form of a small 'Palatinoid', which is a convenient method of prescribing it.

Gonococcus Antigen.—This antigen is a neutral extract of pure cultures of twelve separate strains of gonococci from both male and female sources; the polyvalent character rendering it applicable for use in the diagnosis of any gonorrhoeal infection, whatever the type of the causal organism.

The complement-fixation test by means of this antigen is of great service in the

diagnosis of obscure cases of gonorrhœal infection, and in the subacute stages of the disease when it is not possible to demonstrate the coccus in smears from the discharge. For the purposes of the test, sheep corpuscles and anti-sheep amboceptor are required as in the complement-fixation test for syphilis. Parke, Davis & Co. do not supply these, only the antigen.

Granulogen.—Granulogen is a combination of paraffins having a melting point of about 115° F., with 5 per cent of chloretone (for analgesic effect) and 0.5 per cent of a powerful antiseptic. It forms an excellent flexible dressing for burns, indolent ulcers, superficial wounds, and cutaneous lesions that heal slowly. The granulogen should be liquefied by gentle heat and applied to the part by means of a suitable spraying apparatus or with a sterile camel's-hair brush or cotton mop. A soft, flexible, protective coating soon forms, which excludes air and germs and favours prompt healing.

Granulogen is supplied in tins of 4 and 16 oz. by Parke, Davis & Co.

Hemoplastin.—Hemoplastin, or hæmostatic serum as it is also termed, is derived from equine and bovine serum, and consists principally of prothrombin and anti-anti-thrombin in physiologically balanced solution. It is employed by intravenous, sub-cutaneous, intraspinal, or intraperitoneal injection, also topically, in all forms of hæmorrhage, particularly those depending upon imperfect coagulation of the blood.

Hemoplastin has proved of great value in pulmonary hæmorrhage, intestinal bleeding, epistaxis, hæmorrhage of the new-born, purpura hæmorrhagica, and operative hæmorrhage, such as occurs in tonsillectomy, herniotomy, amputations, etc.

Hemoplastin is supplied by Parke, Davis & Co. in bulbs containing 2 c.c. The dose for intravenous or subcutaneous injection is from 1 to 2 c.c., whether for a child or an adult, to be repeated every four to six hours until the hæmorrhage is controlled.

Iglodine.—This is a triad salt of iodine having the formula $C_2H_5I + H_2O$. It has proved a very safe and efficient antiseptic both for the treatment of wounds and for disinfection of the upper air-passages. In cases of influenza it has been used with good results both as a spray and taken internally. We think it will prove a very useful addition to our resources. It is manufactured by the Iglodine Co. Ltd., Newcastle-on-Tyne.

Kerocain.—This is the name given to the novocain manufactured by Thomas Kerfoot & Co., Ltd., of Bardsley Vale, Lancashire. The high standard of the product is a great credit to the chemical manufacturers of the country. It has proved to be one of the most efficient and safest of the local anæsthetics which have been introduced either for medical or dental practice.

It is sent out in several convenient forms. Kerocain "A"—(10 tablets in a tube)—one tablet dissolved in 7 dr. of distilled water gives a solution of 0.5 per cent of kerocain and 1-160,000 adrenalin. Kerocain "B"—(10 tablets in a tube)—one tablet dissolved in 80 min. of water makes a solution containing 2 per cent of kerocain and 1-10,000 adrenalin. Kerocain "C"—one tablet dissolved in 17 min. of water gives a solution containing 5 per cent of kerocain with 1-10,000 adrenalin. Special tablets are supplied for dental use, kerocain "D" without adrenalin, and kerocain "E" with adrenalin.

All the various formulæ are sent out in ready-made solutions in 1- or 2-oz. bottles.

The firm issues a little booklet containing valuable hints on local anæsthesia, which we recommend our readers to obtain.

Mammary Substance Tablets.—Each tablet represents 5 gr. of desiccated substance equivalent to 30 gr. of fresh gland from young and adult cattle. It is believed that, in addition to its galactogenic function, the mammary gland secretes a hormone which is antagonistic to the ovarian hormone, and that the administration of the gland substance is likely to be beneficial in conditions indicating ovarian hyperactivity or uterine hypofunction.

The administration of this substance has been employed to promote increased activity of the lacteal glands, also in menorrhagia of young girls and in metrorrhagia of the climacteric. It is said to diminish excessive menstrual flow, also to control hæmorrhage due to uterine sclerosis or fibroids.

The dose is 1 to 2 tablets, before meals, two or three times daily. (Parke, Davis & Co.)

Manganese Colloid ('OSCOL' BRAND).—This colloid has been used with remarkable and surprising results in streptococcal and staphylococcal infections, such as coccogenic skin disease, or deep abscesses, boils, and deep-seated impetigo, when associated with oscol sulphur, although it does not seem to give very good results when used alone. When associated with oscol sulphur, it has been found very useful in superficial impetigo, acute folliculitis, and chronic seborrhœic eczema. It has also been used with success in sulphur poisoning such as mustard gas (dichlorethyl sulphide). Excellent results have been recorded of its use in cases of gonorrhœa in acute stages. (Oppenheimer, Son & Co.)

Mercury Salicylate Ampoules.—Some authorities state that the intramuscular injection of mercury salicylate is the most satisfactory form of mercury treatment. Parke, Davis & Co. supply a suspension of mercury salicylate in ampoules, each containing 1 gr. of the freshly-precipitated salt diffused in an oily vehicle, to which is added a small quantity of chloretone to obviate pain at the site of injection. In the treatment of syphilis, the contents of one ampoule may be injected slowly, deep into the gluteal muscle, every fourth day, or more frequently if the full systemic effect is not thereby obtained.

Molevac.—This is a combined peristaltic stimulant and intestinal lubricant which is particularly useful in cases of chronic constipation where the merely mechanical effect of liquid paraffin proves insufficient. It is a combination of the finest liquid paraffin with a small proportion of cascara evacuant and malt extract.

Molevac is free from the objectionable feature of traversing the bowel too rapidly, it is agreeable to the taste, and generally very effective.

Small repeated doses, from 1 teaspoonful upwards, continued over a considerable period, are recommended, the dose to be increased or reduced in accordance with the effect produced after three or four days of treatment. An immediate effect must not be expected. (Parke, Davis & Co.)

Omnopon-Atrinal ('Roche').—This is intended to replace the morphine-atropine used as a preliminary to anaesthesia. It reduces the state of excitation, and a smaller quantity of ether is necessary. (The Hoffmann-La Roche Chemical Works Ltd.)

Ophthalmic 'Cerettes'.—Oppenheimer, Son & Co. Ltd. have put up, in the form of a 'Cerette', an ointment found of great service by Dr. McGillivray in treatment of phlyctenular ulcers of the cornea. It contains hyd. oxid. flav. 2 gr., cocaine 3 gr., atropine 1 gr., *adepts lanæ cum vaseline* 2 dr.

Personally we should think the quantity of hyd. oxid. flav. might be diminished with advantage.

The 'Cerette' is a gelatin capsule in which various ointments are dispensed, and forms a most convenient method when only small quantities are required.

Orchic Substance Tablets.—Each tablet represents 5 gr. of carefully desiccated orchic substance (also known as orchitic or testicular substance), equivalent to 60 gr. of the fresh gland.

The administration of orchic substance is adopted in order to provide a supply of testicular secretion in cases of natural deficiency; it is also believed to exert a stimulating influence on the organ, favouring restoration of normal function, and to improve the tone of the whole glandular system, particularly of those organs which are concerned in the production of energy.

The treatment has been reported to be beneficial in cases of neurasthenia, diabetes, prostatic hypertrophy, impotence, hysteria, hystero-epilepsy, etc., also in eczema, psoriasis, and certain forms of obesity.

The dose is 1 tablet, shortly after meals, two or three times daily. This may be gradually increased as found necessary. (Parke, Davis & Co.)

'Osmos' Aperient Water.—This is an artificially prepared mineral water having the same ingredients as are found by analysis in the Hunyadi Janos spring. It has proved useful for the same purpose for which the waters of these springs are famed. It is a safe and efficient laxative, and especially indicated in cases where there is abdominal plethora as well as constipation. It is made by Valentin, Ord & Co., Crown Wharf, Hayes, Middlesex.

Ovarian Substance Tablets.—Each tablet contains 5 gr. of desiccated ovarian substance, equivalent to 30 gr. of fresh gland.

Recent experimental work indicates that certain structures in the ovary other than the corpora lutea possess definite endocrine functions. Therefore the whole gland has been employed in making these tablets.

Ovarian substance is valuable in disorders due to hyposecretion of the gland, e.g., in the nervous and trophic disturbances of the menopause, especially after oöphorectomy, and in vomiting of pregnancy. Beneficial effects have been reported from its use in infantilism of the genital organs, functional dysmenorrhœa, menorrhagia, metrorrhagia, also in osteomalacia, and certain forms of hysteria and neurasthenia. In chlorosis, ovarian substance often proves a valuable auxiliary to iron treatment.

The dose is 1 tablet at bedtime, the amount to be gradually increased until the effect is attained or it is concluded that no benefit is resulting. (Parke, Davis & Co.)

Palladium Colloid, and Stannum Colloid ('Oscol' Brands).—Colloids of these metals have proved useful in various coccogenic infections, boils, carbuncle, and other conditions due to micrococcus infections.

The 'Oscol' Brand of these metals is supplied by Oppenheimer, Son & Co. Ltd., who have also prepared them in a form suitable for inunction, with a lanolin basis, under the name of 'Oscol Arganosols'.

Pitrenalin.—This preparation combines adrenalin, the active principle of the suprarenal gland, with pituitrin, a solution of the active principles of the pituitary gland, the proportions being 0.25 mgrm. of the former to 0.5 c.c. of the latter.

This combination has been reported to be very effective in relieving bronchial asthma; it appears to afford more rapid and complete relief than adrenalin alone does, and has been thought to diminish the frequency of asthmatic attacks.

As the simultaneous administration of pituitrin appears to intensify the action of adrenalin in certain conditions, e.g., in shock and in the cardiac depression of pneumonia, diphtheria, etc., pitrenalin will be useful in such cases and, indeed, whenever it is desired to obtain the physiological effect of adrenalin with the minimum dosage.

Pitrenalin is supplied by Parke, Davis & Co. in ampoules of 0.5 c.c., which quantity constitutes an average dose for hypodermic administration.

Pituitary Gland Tablets.—For some time past Parke, Davis & Co. have supplied tablets prepared from the anterior lobe of the pituitary gland and also tablets prepared from the posterior lobe. They now supply tablets prepared from the whole gland, each representing 2 gr. of fresh substance.

The administration of these tablets is indicated in cases which exhibit signs of imperfect function of the pituitary gland, especially the obese type of sexually infantile pituitary dystrophy. By reason of the stimulating effect of the posterior lobe principles contained in these tablets, they sometimes prove more rapidly beneficial than anterior lobe tablets in cases showing deficient anterior lobe function merely, without signs of posterior lobe deficiency.

The dose is 1 to 2 tablets, gradually increased with caution to avoid the effects of excessive or too-long-continued use, such as headache, high blood-pressure, or sugar in the urine.

Quinine Salicylate.—This preparation, which is so valuable as a febrifuge, was unobtainable during the war. It is now manufactured by Menley & James Ltd., and is a much better product than we formerly received from Germany. It is to the advantage of the physician and his patient that the pure British product is specified when prescribing.

Scopolamine 'Stable' ('Roche').—This is the pure lævo-rotatory variety put up in ampoules of $\frac{1}{160}$ gr., $\frac{1}{80}$ gr., and $\frac{1}{40}$ gr. by the Hoffmann-La Roche Chemical Works Ltd. It is used largely in painless child-birth.

Selenium Colloid ('Oscol' Brand).—This was mentioned in an article in the *British Medical Journal* for October 11, 1919, and is referred to by the author as being valuable in certain cases of diseases of malignant type. The colloid 'Oscol' is injected by intramuscular method, and the results observed showed much diminution of pain and tenderness, with healing of ulcerated surface and general improvement in health. (Oppenheimer, Son & Co. Ltd.)

Subitol.—This resembles ichthylol in colour and consistency. It is a compound of ammonia and sulphonic acid in organic combination, and has been used with great success in the treatment of skin diseases. More recently it has come into favour as a dressing for septic wounds under the name of 'Subitine', for which purpose it is mixed with an equal quantity of glycerin. Being hygroscopic it does not dry and become adherent to the dressing material, and wounds need only be dressed once in twenty-four hours. The results are excellent.

Chas. Zimmermann & Co. Ltd. also put up subitol in the form of capsules containing 3 min., and these have been used for rheumatoid arthritis, vesical catarrh, etc. They also make a 15 per cent subitol ointment which has been found very useful in the treatment of burns, etc.

Subitol has also been used in the manufacture of an excellent soap, very suited to all irritable conditions of the skin. It has an emollient and antiseptic effect. Subitol must be regarded as a distinct addition to our resources.

Tonic Syrups.—It is claimed that the preparations of the 'Tonic Syrups' in palatinoid form are more convenient and have certain advantages over the liquid preparations. The palatinoid undoubtedly preserves such salts as phosphate of iron from the action of the air, and it will remain active indefinitely.

Messrs. Oppenheimer, Son & Co. Ltd. put up Parrish's syrup, Easton's syrup, syr. hypophosph. co., syr. triplicis (Edin. Roy. Infirm.) in this form, and the results of administration have been wholly satisfactory.

Tubunic ('Roche').—This is a capsule containing a single dose for hypodermic injection; it is fitted with a needle, protected by a glass tube. To give an injection it is only necessary to remove the tube, insert the needle, and squeeze the capsule. The injection is absolutely aseptic, precise as regards dosage, and a great deal of time is saved.

It is the greatest improvement in pharmacy that has come under our notice for some years. Various solutions are obtainable, and we strongly recommend this method to our readers. (The Hoffmann-La Roche Chemical Works Ltd.)

Ung. Zoleas.—This was the favourite remedy of the late Dr. Braithwaite, of Leeds, for dry and chronic eczema. It is a compound of zinc, mercury, and oleic acid. It requires very careful manufacture, and this it has received at the hands of Oppenheimer, Son & Co. Ltd., whose preparation is both elegant and reliable.

Vitmar.—This is a valuable food product produced by Callard & Co., 74, Regent Street, W.1. It is designed to supply the lack of vitamins, and contains the fat soluble 'A', the water soluble 'B' (antineuritic), and the antiscorbutic vitamins.

It is manufactured from wheat, bone-marrow, eggs, fruit, and sugar, the fat being well emulsified. It has a pleasant sweet flavour, and is taken readily by children.

MEDICAL AND SURGICAL APPLIANCES.

Artery Forceps and Scissors.—The Holborn Surgical Instrument Co. Ltd. have made a great improvement on artery forceps and scissors, by making them with large handles (*Fig. 53*), so that they can be used with far greater facility than those of ordinary size. We feel sure that the surgeon who uses these instruments will not readily return to the ordinary type which are so chary of the space left for the fingers.

Atomizer (Pocket Collapsible).—This appliance possesses the advantages of compactness and safety combined with efficiency in use.

It can be carried in the pocket, for when not in use the glass reservoir is retracted within the rubber bulb. When required for use the reservoir should be brought into the position shown in the illustration (*Fig. 54*) by pinching the end of the rubber bulb.

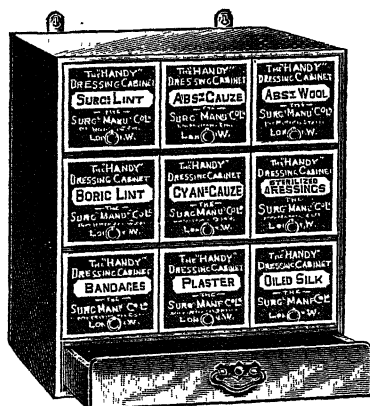


Fig. 55.

They supply them in various sizes, from one holding 9 caddies with a drawer, at £2 7s. 6d. (*Fig. 55*), to one fitted with glass shelves and glass cupboard for surgical

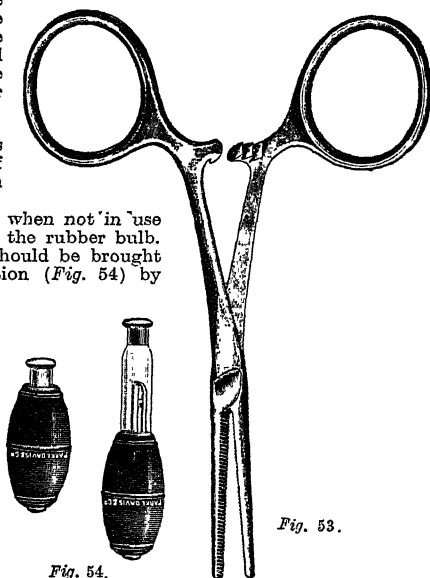


Fig. 54.

Fig. 53.

This atomizer is suitable for use with most solutions employed in nasopharyngeal medication. It is one of the most ingenious appliances that have come under our notice, and is quite efficient. (Parke, Davis & Co.)

Cabinets (The 'Handy').—The Surgical Manufacturing Co. Ltd. are making some cabinets for holding dressings conveniently. One holding 9 caddies with a drawer, at

instruments, with 6 or 8 caddies for instruments beneath. They are quite practical and convenient, and are supplied containing the various dressings required.

Calipers (Pearson's).—These are non-penetrating calipers for applying extension to fractured femurs. They are fitted with a set-screw, which adds to their efficiency (*Fig. 56*).

A smaller size is also supplied for application to the humerus. (Allon & Hanburys Ltd.)

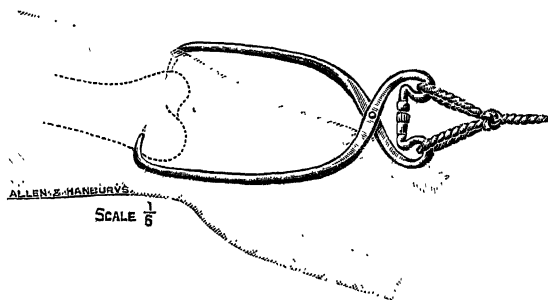


Fig. 56.

Cannula (Double).—By means of the instrument shown in *Fig. 57*, the design of Mr. Wyndham Powell, F.R.C.S., urethral lacunæ can be treated with caustic, or cauterized by electrolysis more quickly and efficiently than with the probe and collapsible mount hitherto employed with the operating aero-

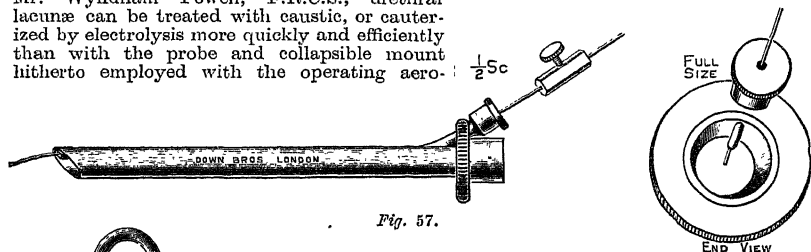


Fig. 57.

urethroscope. It has been designed more particularly for use in clearing out the lacunæ of Morgagni and Littre's glands, which remain inflamed and suppurating after the recovery from inflammation of the rest of the urethra.

It is recommended to have two sizes (22 F. and 26 F.). (Down Bros. Ltd.)

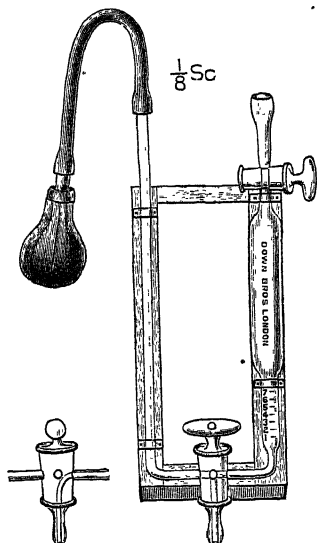


Fig. 58.

Carbon Dioxide Tensimeter.—This instrument (*Fig. 58*) is a slight modification by Dr. E. P. Poulton, of Guy's Hospital, of that originally designed by Fridericia, of Copenhagen; its chief use is for estimating acidosis in the severer types of diabetes.

The instrument is a U-shaped tube fitted with suitable large-bore taps for collecting alveolar air and estimating the percentage in it of CO₂. The patient is instructed to blow through the apparatus. The expired air is shut off by means of the taps. The outlet tube is put in caustic soda solution, which is admitted by the tap to the part containing the expired air. Absorption of CO₂ taking place, the level to which the fluid rises in the tube gives an immediate reading of the percentage of CO₂. No calculation is needed, as the result is indicated by the scale graduated on the glass tube.

The apparatus thus shows at once the percent-

age of CO_2 in the alveolar air. This falls with increasing acidosis, as has been ascertained by the experiments of Haldane, Beddard, and others. (Down Bros. Ltd.)

Catheters and Syringe for Gonorrhœa.—These catheters (*Fig. 59*) are a modification by Mr. A. Allport of the well-known catheters of Mr. Chas. Russ. They are fitted with meatus cones, adjustable by means of binding screws, in such a way as to secure good approximation of the cones when *in situ*. The ends of the catheters can be removed by unscrewing for cleaning.

The fine silver pipette, which is also Mr. Allport's design, enables the catheter to be filled from the distal end to avoid air-bubbles. (Down Bros. Ltd.)

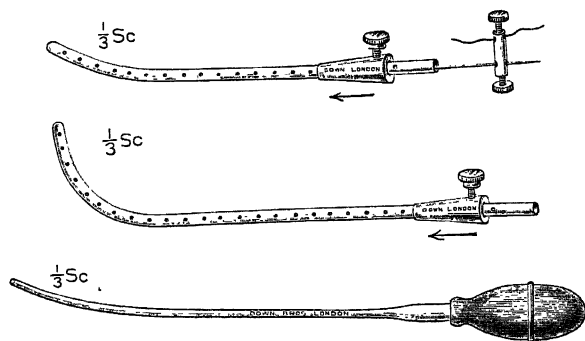


Fig. 59.

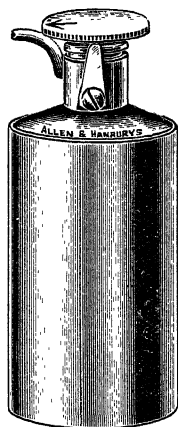
Sc. $\frac{1}{2}$

Fig. 60.

Chloroform Drop Bottle.—An all-metal bottle (*Fig. 60*) has been manufactured by Allen & Hanburys Ltd. It has a metal-regulating stopper, which renders it perfectly air-tight when not in use, and delivers the drops with great regularity when required. It is a very practical appliance, as it is easily carried, and on account of its shape it is not likely to fall over. It is manufactured in 2-oz. and 4-oz. sizes.

Corrugated Rubber Sheetting.—This is a sheet of corrugated indiarubber which can be cut to any size desired and used in the place of rubber tubing, for drainage. It has the advantage over the latter in being easily cleaned, while it secures perfect drainage. It is made at the suggestion of Mr. Arthur Edmunds by Allen & Hanburys Ltd.

Ether Bag Mount (Ventilating).—We illustrate (*Fig. 61*) a bag mount designed by Dr. Beresford Kingsford, which may be used for 'open' or 'closed' inhalation. It fits Hewitt's wide-bore inhaler and face-piece.

Gases can be retained in the bag by opening B and closing T by the stopcock S. This affords a convenient means of giving ethyl chloride either alone or before ether, the bag being charged before applying the face-piece and gradually opened as the window at B is being closed. For the gas-ether sequence a little hot water can be poured into the Ormsby through A. With less than 2 oz. of ether, anæsthesia can then be induced in about three minutes, usually without appreciable coughing or struggling. During the operation, B is always more or less open, so that with every breath the patient gets some fresh air, as warm and moist as the anæsthetist may desire. Geo. Barth & Co. are the manufacturers.

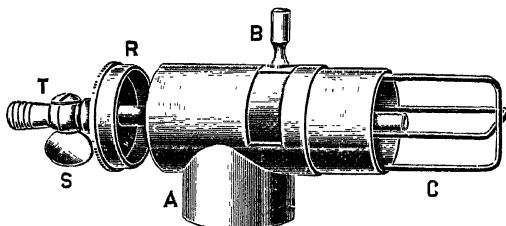


Fig. 61.

Guillotine (New).—This instrument (*Fig. 62*) is a modification of Howarth's guillotine, with sharp and blunt blades, and has been made at the suggestion of Dr. Peter

Macdonald for his method of enucleating the tonsils by torsion. It is claimed that with it the danger of bleeding is much lessened.

When both tonsils are to be removed, two of the instruments are used. The left tonsil is engaged first and the guillotine closed and passed to an assistant to hold. The operator then applies the spare instrument to the right, and holds it after closing. The

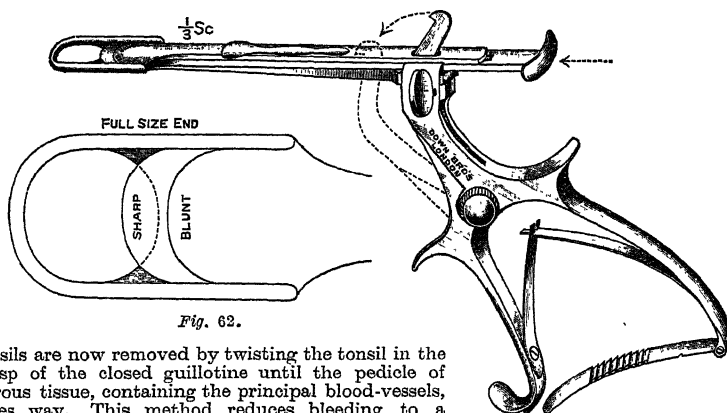


Fig. 62.

tonsils are now removed by twisting the tonsil in the grasp of the closed guillotine until the pedicle of fibrous tissue, containing the principal blood-vessels, gives way. This method reduces bleeding to a minimum.

To obviate the risk of slipping in handing over the first instrument there is a ratchet on the handle which locks the blade as in Elphick's hæmostatic guillotine. For further security the closing lever is turned over at the end to prevent the blade from riding up. This instrument can also be used as a hæmostatic guillotine for La Force's method of leaving the closed instrument *in situ* for five minutes. (Down Bros. Ltd., London, S.E.)

Hypogastric Belt.—In cases of extreme corpulency and pendulous abdomen in females, when the uterus or the intestines tend to press on the bladder and cause irritation, it would be difficult to find any more practical appliance than the hypogastric belt (Fig. 63) made by the Domen Belts Co., 456, Strand, W.C.2. The efficiency of the belt is aided by a large pad which fits above the pubes, and pressure on this pad is maintained by a flexible steel spring. The degree of pressure exercised can be easily modified.

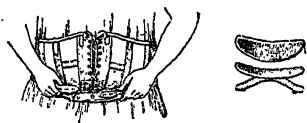


Fig. 63.

By the use of this belt many cases of chronic lumbar pain can be immediately relieved, as the support given to the intestines removes the cause.

Lace Mesh.—This mesh was introduced to prevent dressings sticking to wounds. It is applied directly over the wound, and some antiseptic gauze is placed over it. It has been a great boon to surgeons, especially for skin-grafting operations where the sticking of the dressings is a considerable hindrance to efficient results. Its general usefulness, and the economy it effects with use of dressings, are evident. This mesh can now be obtained from Menley & James Ltd.

Laryngotome and Tracheotome.—This is a remarkable little instrument, and it enables the operations of laryngotomy and tracheotomy to be performed quickly and with perfect safety. This is due to the fact that after a small incision is made in the skin, the tracheotomy tube (Fig. 64) cuts its own way into the trachea and fills the self-made hole without the smallest risk of blood escaping into the air-passages. Immediately it has passed into the trachea or larynx its cutting edge is withdrawn into the tube, which is then pushed home. The whole operation can be performed in less than a minute. Mr. Lawrence Abel is the inventor of this instrument, which is manufactured by A. E. Braid & Co. Ltd., 30, Gower Place, W.C.1.

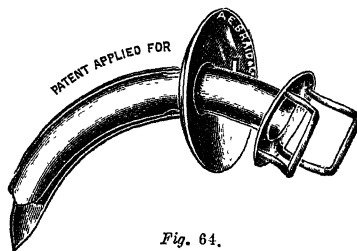


Fig. 64.

Nasal Cutting Forceps.—These are made from the design of Dr. McCoy, an American nasal specialist. They are supplied both straight and curved by the Holborn Surgical Instrument Co. Ltd. (*Fig. 65*).

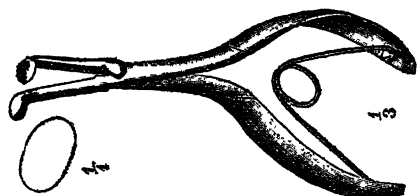


Fig. 65.

Negative Pressure Apparatus.—This has been devised by Mr. A. Allport, and used by him at Rochester Row for the vacuum treatment of chronic gonorrhoea. A negative pressure catheter, such as Cambell's or Mills', is attached to a length of stout rubber tubing and passed.

The catheter being *in situ*, the moveable glass receptacle on the right side of the apparatus is raised or lowered, producing a vacuum in the fixed receptacle on the opposite side: of a tension corresponding to the reciprocal movement of the mercurial surfaces in the two tubes. The vacuum is registered simultaneously on the manometer in the centre of the board (*Fig. 66*).

It is considered that this vacuum is more delicate and less liable to sharp disturbances than that induced by an ordinary suction pump. (Down Bros. Ltd.)

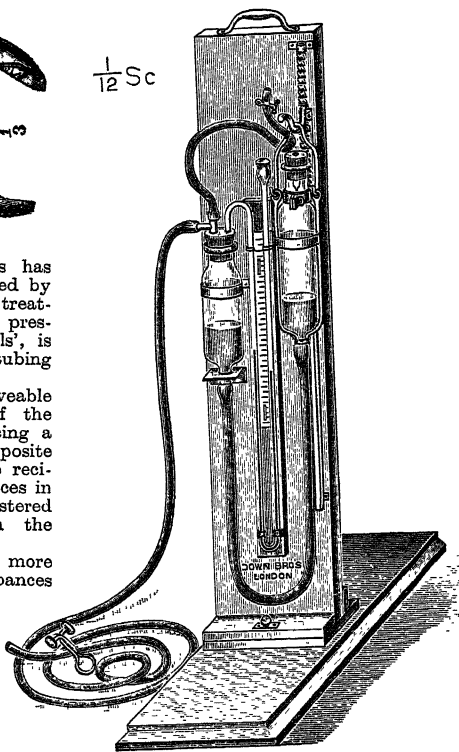


Fig. 66.

Another instrument (*Fig. 67*), made at the suggestion of Mr. C. H. Mills, surgeon to St. Paul's Hospital, consists of a framework of four longitudinal wires which distend the urethra while suction is applied. It is made in three sizes, two for the anterior, and one for the posterior urethra. The latter is fitted with a rubber disc at its vesical end, so that bladder contents do not escape during the treatment. It can be used with a rubber suction ball as shown, or connected up with a pump and manometer or an Allport's negative-pressure apparatus, for better control.

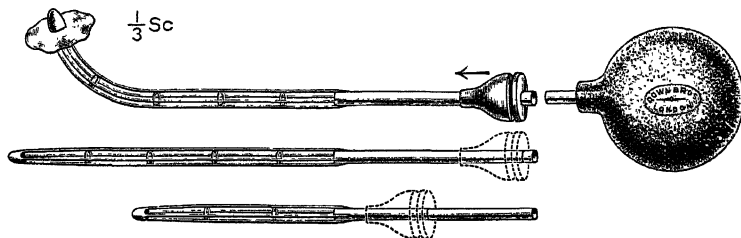


Fig. 67.

It has been used in the treatment of long-standing cases at the Military Hospital, Rochester Row, London. (Down Bros. Ltd.)

Nozzle (Macalpine's).—This is a convenient form of urethral irrigator, which is very compact and fitted with a stop-cock which can be easily regulated. The nozzle and cap (*Fig. 68*) are detachable for purposes of sterilization. (Allen & Hanburys Ltd.)

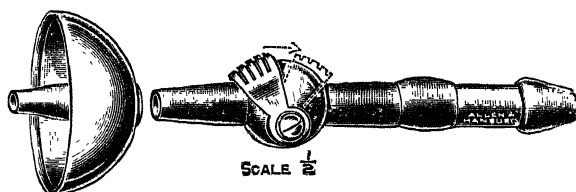


Fig. 68.

Pile Forceps.—The Holborn Surgical Instrument Co. Ltd. send us two samples of pile forceps which are a great improvement on some we have used, as they give a very complete and efficient grip. We illustrate the two different patterns of blade (*Fig. 69*).

Pneumameter.—An appliance for exercising the lungs, and especially useful in the after-treatment of empyema. It is fitted with a graduated scale giving the air-capacity of the lungs in inches and centimetres. (Allen & Hanburys Ltd.)

Pneumatic Injector for Local Anæsthesia.—This apparatus was designed in accordance with the suggestions of Mr. E. G. Slesinger, F.R.C.S., to meet the well-known drawbacks of syringe-injection in local anæsthetization.

The apparatus (*Fig. 70*) consists of an airtight barrel container with needle and rubber attachment, to which an inlet-valve for air has been fitted. The container is filled to a point that allows at least 100 c.c. for the admission of air, and by means of a pump air is forced in until pumping is no longer possible. Injection can then take place. By lightly pressing a button-valve on the needle-mount the fluid can be injected under sufficient pressure to produce even pressure-anæsthesia if required. The advantages claimed are economy of

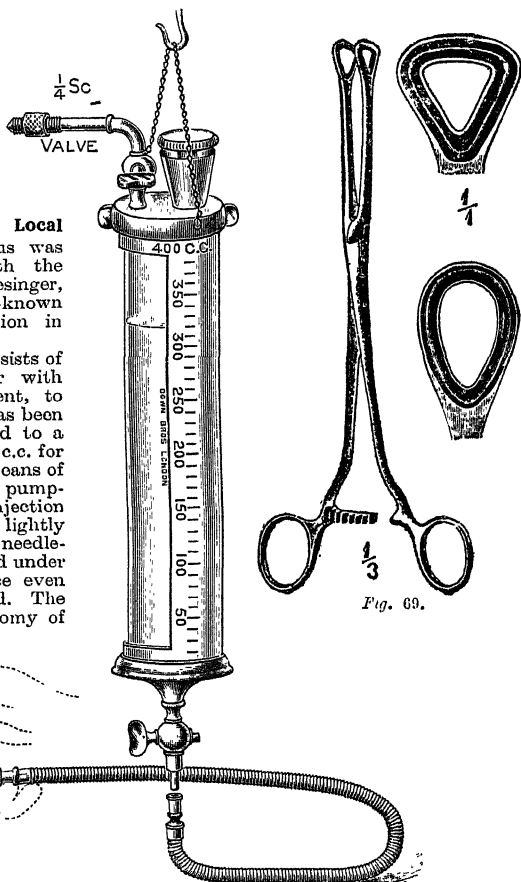


Fig. 70.

time, treatment of several cases with one charge, no disturbance of needle as from manipulation of a syringe, better control of injection, the amount used at a time is clearly seen, and there is little liability of breakage or getting out of order as with a syringe.

The apparatus is also useful for a number of successive serum injections. It is only necessary to flame the needle between each injection. Made by Down Bros. Ltd.

Sterilizer Forceps.—The Holborn Surgical Instrument Co. Ltd. have greatly improved on the ordinary sterilizer forceps. They send us two forms (*Figs. 71, 72*)

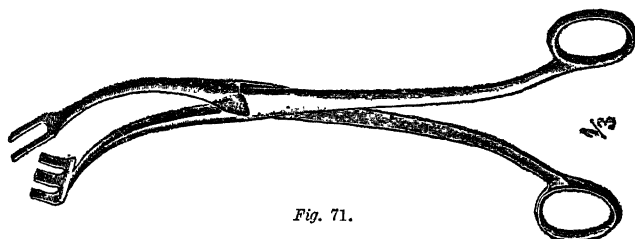


Fig. 71.

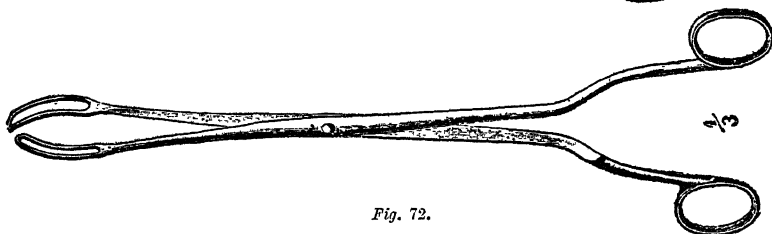


Fig. 72.

which will take a ready grip on any size of instrument and take up syringes, etc. They also produce a pattern which has fibre handles (*Fig. 73*). These can be left in the sterilizer when in use, but the handles will always remain cool.

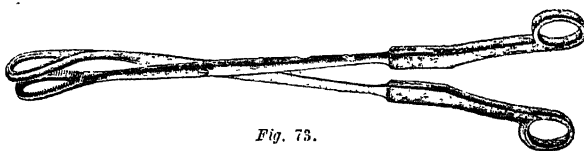


Fig. 73.

Torch ('The Exam-lite').—This is an electric torch (*Fig. 74*) fitted with a series of lenses which cause it to give a brilliant, optically perfect light. It may be used for either direct or indirect examination of patients, and it is activated by an exceptionally large cell which should not require renewal for some time. It is a very practical instrument made by Allen and Hanburys Ltd.

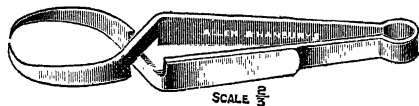
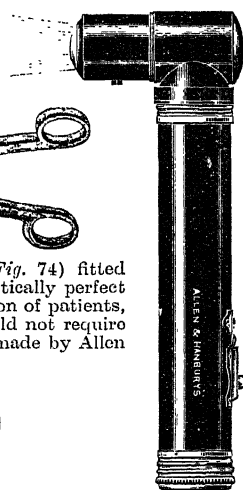


Fig. 75.

Sc. $\frac{1}{4}$
Fig. 74.

Towel Clips.—We have received from Allen & Hanburys Ltd. a sample of cross-action towel clip (*Fig. 75*) made of stainless steel. As such instruments are being constantly sterilized, the advantage of stainless steel is self-evident. We understand that the firm are going to apply this principle to other instruments, and by doing so will make a great advance in this branch of manufacture.

Tuning-fork for Vibratory Sensation.—That the response of the sensory nerves to the vibrations of a tuning-fork placed in contact with certain parts of the body is impaired in certain diseases of the nervous system, was demonstrated some years since in this country by Mr. R. T. Williamson.

Previous experiments on individuals by Egger, Rumpff, Treitel, etc., on the continent, had not gone much beyond investigation of the sensation itself.

In 1912 Dr. J. L. M. Symms, of the Neurological Department, Netley, published in the *British Medical Journal* (*vide* vol. i, 1912, pp. 539 to 540) a development of his method by which the conditions preceding impairment of this perception could be recorded as a numerical ratio. These results, taken from actual cases of peripheral neuritis, were recorded graphically.

The tuning-fork used was made by Down Bros. Ltd. This tuning-fork, which is shown in the illustration (*Fig. 76*), has a vibration rate of 108.75. Two pieces of steel

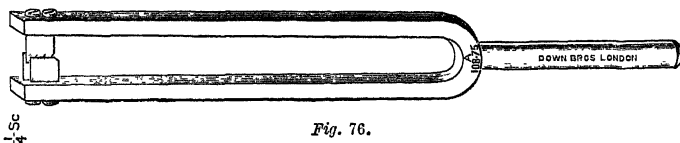


Fig. 76.

attached to the prongs cause a small window to appear during the vibration until a certain amplitude is reached. As soon as the window disappears the fork is applied to the subcutaneous bony point under investigation, and a stop-watch is started. The patient gives a sign at the exact moment when his perception of the vibration ceases. The watch is then stopped and the time recorded. The points usually taken are the malleoli, tibia, anterior superior spine, sacrum, sternum, radius, and ulna. The maximum, minimum, and mean intervals in normal individuals have thus been recorded in seconds and also expressed graphically as curves.

Urethral Cannula.—Messrs. Allen & Hanburys Ltd. have made a new urethral cannula (*Fig. 77*) for use with Wyndham Powell's urethroscope, for cauterizing the lacunæ. It is made in three sizes (Nos. 22, 24, and 26 French catheter gauge).

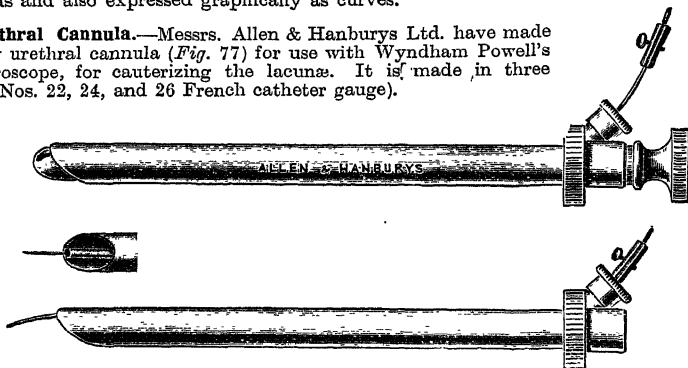


Fig. 77.

Urethroscope for Operating.—The advantage of the 'Holborn' urethroscope (*Fig. 78*) is that the operating instruments are manipulated by means of a handle fitted laterally to the air chamber. This handle has a ball-and-socket joint, and the operator has complete control over the instruments employed, while he can place his eye close to the lens and obtain an unobstructed view of the part he is operating upon. This is a very great advance on previous instruments. It is made by the Holborn Surgical Instrument Co. Ltd.

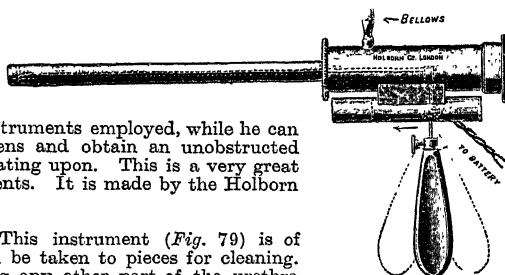


Fig. 78.

Urethrotome (Bredin's).—This instrument (*Fig. 79*) is of simple construction and can be taken to pieces for cleaning. There is no danger of cutting any other part of the urethra than that desired, as the length and depth of the cut can be

regulated by the adjusting screw and made when the operator is certain that the instrument is in position.

In use the filiform bougie is inserted, and the operator can tell if he is successful in

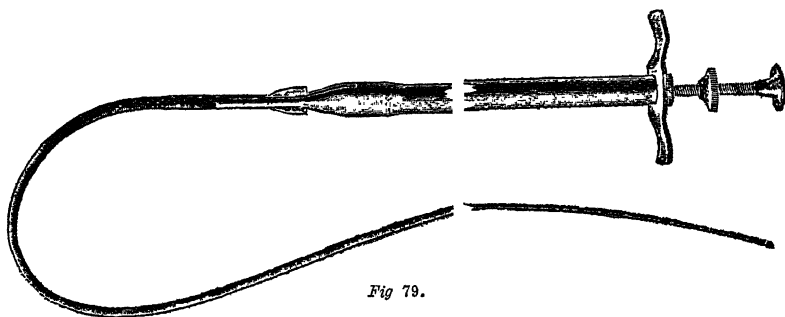


Fig. 79.

passing the bougie through to the bladder by the drops of urine which will appear when this has been achieved. The instrument is screwed on to the bougie and inserted as far as it will go, when the conical end of the shaft will come in contact with the stricture. The instrument is then slightly withdrawn, the knives opened, and the stricture cut, the operation being repeated until a passage is made. The opening made by the knives will be sufficient to pass a 28 French gauge sound.

It will be seen that with this instrument the knives are concealed until the moment they are required, and well under the control of the operator, and damage to the healthy parts of the urethra can be avoided. (The Holborn Surgical Instrument Co. Ltd.)

The same firm make a Urethral Cutting Forceps (Fig. 80), on the same principle as the nasal cutting forceps noticed above, but it has a long narrow shank so that it can be used through a urethroscopic tube.

Walking-stick Crutch.—Messrs. Allen & Hanburys Ltd. have produced a walking-stick with a support for the forearm to save and distribute the pressure on the wrist. This has proved a great help in many cases, although the support increases the weight of the stick.

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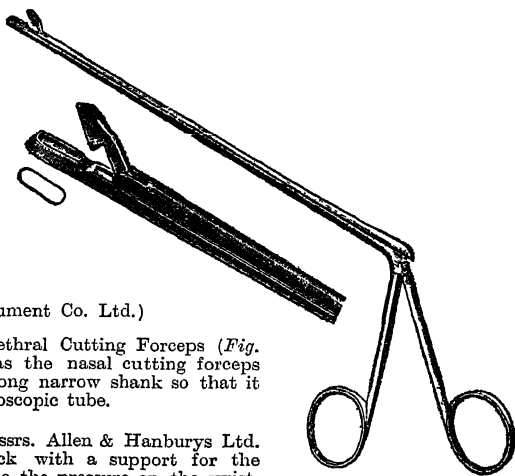


Fig. 80.

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Cork.—*District Asylum*. Res. Med. Supt., Dr. J. J. FitzGerald. Cork, 2 miles, *Lindville*, Cork. Res. Med. Props., Dr. C. A. P. Osburne and Dr. J. C. Osburne.

Cupar (Fifeshire).—*Fife and Kinross District Asylum*. Res. Med. Supt., James H. Skeen, M.B. Springfield station, N.B.R., ¼ mile.

Darlington (Durham).—*Middleton Hall*, Middleton St. George. Res. Med. Supt., L. Harris-Liston, M.D. Dinsdale station, 1 mile.

Dartford.—*City of London Mental Hospital*, near Dartford. Res. Med. Supt., Dr. R. H. Steen. Dartford, S.E.R., 1½ miles. See also p. 598

Denbigh (N. Wales).—*North Wales Counties Asylum*. Med. Supt., Frank G. Jones, M.D. Denbigh, 1 mile.

Derby.—*Borough Mental Hospital*, Rowditch. Res. Med. Supt., Dr. S. R. Macphail. G.N.R. station, 1 mile; M.R., 2 miles. Private patients received. See also p. 600

The County Asylum, Mickleover. Res. Med. Supt., M. L. Rowan, M.D. Derby, M.R., 5 miles; Mickleover, G.N.R., 2 miles.

Devizes.—*Wilts County Asylum*. Res. Med. Supt., S. J. Cole, M.D. Devizes, 1 mile.

Dorchester.—*Dorset Mental Hospital*. In connection therewith: "Herrison House," the large private block in the grounds. Res. Med. Supt., G. E. Peachell, M.D. Dorchester, 3 miles. See also p. 602

Downpatrick.—*Down District Asylum*. Res. Med. Supt., M. J. Nolan, L.R.C.P.I. and L. M. Downpatrick, 1 mile.

Dublin.—*Bloomfield*, Morehampton Rd. Med. Off., H. T. Bewley, M.D. Dublin, 1 mile.

Elm Lawn, Dundrum, Co. Dublin (ladies). Prop., Miss Bernard. Vis. Phys., Dr. A. S. Goff.

Farnham House and Maryville, Finglas, Dublin. Res. Med. Supt., H. P. D'Arcy Benson, M.D. Cab from Dublin, 2 miles. See also p. 575

Highfield (for ladies), Drumcondra ; *Hampstead* (for gentlemen), Glasnevin. Res. Med. Supts., Hy. M. Eustace, B.A., M.D., and Wm. N. Eustace, L.R.C.P.I. & S.I. By rail, Dublin. See also p. 601

House of St. John of God, Stillorgan, Dublin. Res. Phys., Dr. P. O'Connell. Stillorgan station, $\frac{1}{2}$ mile.

Portrane District Asylum, Donabate, Dublin. Dep. Med. Supt., J. M. Redington, F.R.C.S.I.

Richmond District Asylum, Dublin. Res. Med. Supt., Dr. J. O'Connor Donelan.

St. Patrick's Hospital, James's Street, Dublin. Res. Med. Supt., Dr. R. R. Leeper. Branch Asylum, *St. Edmondsbury*, at Lucan. See also p. 536

St. Vincent's Asylum, Fairview, Dublin. Vis. Physicians, John Murphy, F.R.C.P.I., and F. X. Callaghan, F.R.C.P.I. Apply to the Superioress.

Stewart Institution, Palmerston, Chapelizod, Co. Dublin. Res. Med. Supt., F. E. Rainsford, M.D. Kingsbridge station, $2\frac{1}{2}$ miles.

Verville, Clontarf, near Dublin. Prop., Dr. P. D. Sullivan.

Dudley (Stafford).—*Ashwood House*, Kingswinford. Props., Drs. Peacock and Pietersen. Res. Med. Supt., Dr. J. F. G. Pietersen. Stourbridge Junc., $3\frac{1}{2}$ miles ; Dudley station, $\frac{1}{2}$ miles ; Wolverhampton, 7 miles. Tel. : 19 Kingswinford.

See also p. 599

Dumfries.—*Crichton Royal Institution*. Res. Med. Supt., Dr. C. C. Easterbrook. Dumfries, 1 mile.

Dundee.—*Baldovan Institution* (for the treatment and education of the feeble-minded). Med. Supt., W. B. Drummond, F.R.C.P.E. Downfield, 1 mile ; Dundee, $4\frac{1}{2}$ miles.

Dundee District Asylum, Westgreen, Dundee. Res. Med. Supt., W. Tuach-Mackenzie, M.D. Dundee, 3 miles ; Liff, $1\frac{1}{2}$ miles.

Dundee Royal Asylum, *Gowrie House*, Dundee. Vis. Med. Off., A. B. Dalgetty, M.D. Sec., J. Wilkie, 20, Reform Street, Dundee.

Durham.—*County Asylum*, Winterton. Res. Med. Supt., Dr. H. G. Cribb. Sedgfield station, $2\frac{1}{2}$ miles, by bus.

Gateshead County Borough Asylum, Stanington, Newcastle-on-Tyne. Res. Med. Supt., Lt.-Col. J. V. G. B. Tighe, M.B.

Sunderland Borough Mental Hospital, Ryhope. Res. Med. Supt., J. Middlemass, M.D.

Edinburgh.—*Edinburgh District Asylum*, Bangour Village, West Lothian. Res. Med. Supt., J. Keay, M.D. Bangour (Private) N.B.Rly.

Midlothian and Peebles District Asylum. Res. Med. Supt., James H. C. Orr, M.D. Rosslynlee, 1 mile ; Edinburgh, 12 miles.

Royal Edinburgh Asylum, Morningside. Res. Phys. Supt., Professor George Robertson. Edinburgh, $1\frac{1}{2}$ miles.

New Saughton Hall, Polton. Med. Supt., J. Batty Tuke, M.D., F.R.C.P. Edin. Polton station, 5 minutes ; Loanhead, 10 minutes' walk. See also p. 590

Elgin.—*District Asylum*. Res. Supt., Annie A. Kinloch. Vis. Med. Off., Dr. D. G. Campbell. Elgin, $1\frac{1}{2}$ miles.

Enfield.—*Elm Lodge*, Clay Hill (for ladies). Res. Licensees, Dr. F. and Mrs. Watson. Enfield station, $1\frac{1}{2}$ miles.

Ennis.—*District Asylum*. Res. Med. Supt., Dr. F. O'Mara. Ennis station, 2 miles.

Enniscorthy (Co. Wexford).—*District Lunatic Asylum*. Res. Med. Supt., Dr. H. T. J. Kennedy. Enniscorthy, 1 mile.

Epsom (Surrey).—*The Silver Birches*, Church Street (for ladies). Res. Licensee, Miss Daniel. Co-Licensee, Dr. E. C. Daniel. L. & S.W.R. and L.B. & S.C.R., 5 minutes. Tel. : 346 P.O. Epsom.

See also p. 602

Exeter.—*City Asylum*, Digbys, Heavitree. Res. Med. Supt., G. N. Bartlett, M.B., B.S. Exeter, 3 miles.

See also p. 576

Court Hall, Kenton, near Exeter. Res. Licensees, Miss Mules, M.D., B.S., and Miss A. S. Mules. Starcross, 1 mile.

Devon Mental Hospital, Exminster. Res. Med. Supt., Dr. Arthur N. Davis. Exminster, $1\frac{1}{2}$ miles ; Exeter, 4 miles.

Wonford House Hospital for the Insane, Exeter. Res. Med. Supt., W. B. Morton, M.D. Exeter station (Queen St.) $1\frac{1}{2}$ miles ; (St. David's), 2 miles.

Fairford (Gloucestershire).—*Fairford Retreat*. Res. Med. Supt., A. Dewar, M.D. Fairford, 1 mile.

Glasgow.—*District Mental Hospital*, Woodilee. Res. Med. Supt., H. Carre, L.R.C.P. & S. Lenzie station, 1 mile ; Glasgow, 8 miles.

Glasgow District Hospital for Mental Diseases, Gartloch. Res. Med. Supt., W. A. Parker, M.B. Garnkirk station, 1 mile.

Govan District Asylum, Hawkhead, Glasgow. Res. Med. Supt., Dr. J. H. MacDonald. Crookston station.

Kirklands Asylum, Bothwell, Glasgow. Res. Med. Supt., Wm. M. Buchanan, M.B. Bothwell and Fallside stations, $\frac{1}{2}$ mile Glasgow, 9 miles.

Lanark District Asylum, Hartwood, Lanarkshire. Med. Supt., Dr. N. T. Kerr. Hartwood station, $\frac{1}{2}$ mile.

Royal Asylum, Gartnavel. Res. Phys. Supt., Landel R. Oswald, M.B.

Smithston Asylum, Greenock. Vis. Med. Off., Dr. James Laurie. Greenock West, $1\frac{1}{2}$ miles.

Gloucester.—*Barnwood House.* Res. Med. Supt., Arthur A. D. Townsend, M.D. Gloucester, 2 miles. *See also p. 600*

Gloucester County Asylums, Wotton and Barnwood, Gloucester. Res. Med. Supt., Dr. J. Marnan. Gloucester station, 1 mile.

Guernsey.—*St. Peter Port Asylum.* Med. Off., E. K. Corbin, M.R.C.S.

Haddington. **N.B.**—*East Lothian District Asylum.* Supt., Miss Jean Sinclair. Med. Off., H. H. Roberts, M.D. Haddington station, 10 minutes.

Hatton (near Warwick).—*County Asylum.* Res. Med. Supt., A. Miller, M.B. Hatton, G.W.R. station, 2 miles; Warwick, 3 miles.

Haywards Heath.—*Brighton County Borough Mental Hospital.* Res. Med. Supt., C. Planck, M.A., M.R.C.S. Haywards Heath, 1½ miles.

Hellingly.—*East Sussex County Mental Hospital,* near Eastbourne. Res. Med. Supt., F. R. P. Taylor, M.D., B.S. Hellingly, 1 mile. *See also p. 598*

Henley-in-Arden (Warwickshire).—*Glen-dosill and Hurst Houses* (for both sexes). Res. Prop., Dr. S. H. Agar. Henley-in-Arden, G.W.R., ¼ mile.

Hereford.—*Hereford County and City Mental Hospital,* Res. Med. Supt., T. C. Graves, M.D., F.R.C.S.E. Barrs Court, G.W., Mid., and L. & N.W.R., Hereford, 3 miles.

Hitchin (Herts), near.—*Three Counties Asylum.* Res. Med. Supt., L. O. Fuller, M.R.C.S. Three Counties station, 1 mile.

Huddersfield (near).—*West Riding Asylum, "Storches Hall,"* Kirkburton. Res. Med. Supt., T. S. Adair, M.D. Kirkburton, L. & N.W.R., 1 mile.

Hull.—*City Asylum.* Res. Med. Supt., J. Merson, M.D. Willerby station, 1 mile; Hull, 6 miles.

Inverness.—*District Asylum.* Res. Med. Supt., T. C. Mackenzie, M.D. Inverness, 2½ miles.

Ipswich.—*Borough Mental Hospital.* Res. Med. Supt., Dr. W. M. Ogilvie. Ipswich, 2 miles.

Isle of Man.—*Lunatic Asylum,* Union Mills, Douglas. Res. Med. Supt., F. C. Blakiston, M.R.C.S., L.R.C.P. Union Mills, ½ mile.

Isle of Wight.—*The County Asylum,* Whitecroft. Res. Med. Supt., W. J. A. Erskine, M.D. Blackwater, ¾ mile; or Newport, 2½ miles. *See also p. 601*

The Briers, Sandown, I.W. (for ladies). Licensees, The Misses Griffiths.

Isleworth (Middlesex).—*Wyke House.* Res. Prop., Dr. F. Murchison. Isleworth, Brentford, and Osterley station, 1 mile.

Ivybridge.—*Plymouth Mental Hospital.* Res. Med. Supt., Dr. Wm. Starkey. Bittaford, ¼ mile; Wrangaton, G.W.R., 1½ miles; Ivybridge, 3 miles.

Jersey.—*Cranbourne Hall,* Grouville. Med. Supt., A. C. Stamborg, M.D. Grouville, 2 minutes' walk.

Jersey Asylum. Res. Med. Supt., Julius Labey, M.R.C.S. Gorey Village, 1 mile.

Kilkenny.—*Belmont Park.* Conducted by the Brothers of Charity. Vis. Phys., Dr. W. R. Morris.

District Asylum, Kilkenny. Res. Med. Supt., Louis Buggy, L.R.C.P. Kilkenny station, ¼ mile.

Killarney.—*District Asylum.* Res. Med. Supt., E. W. Griffin, M.D. Killarney, ½ mile.

Knowle (near Fareham).—*County Asylum.* Med. Supt., H. K. Abbott, M.D. Knowle platform, ½ mile.

Lancashire (near Newton-le-Willows).—*Haydock Lodge, Private Mental Hospital.* Res. Med. Prop., Dr. C. T. Street. Newton-le-Willows, 2 miles. *See also p. 587*

Lancaster.—*County Asylum.* Res. Med. Supt., D. M. Cassidy, M.D. Also "*The Retreat*," for private patients. Lancaster, L. & N.W. and Midland stations, each 1½ miles. *See also p. 571*

Larbert (Stirlingshire).—*The Royal Scottish National Institution* (for education of imbecile children). Res. Med. Supt. Dr. R. D. Clarkson. Larbert station, 1 ml.

Leek (Stafford).—*County Mental Hospital,* Cheddleton. Med. Supt., W. F. Menzies, M.D. Wall Grange station, 1 ml.

Leicester.—*Mental Hospital,* Humberstone. Res. Med. Supt., J. F. Dixon, M.D. Humberstone, ½ mile; Leicester, 2 miles.

Leicestershire and Rutland Asylum. Res. Med. Supt., R. C. Stewart, M.R.C.S. Narborough, ¾ mile; Leicester, 6 miles.

Letterkenny.—*Donegal District Asylum.* Res. Med. Supt., E. E. Moore, M.D. Letterkenny and Lough Swilly Rly., 1 ml.

Lichfield.—*County Mental Hospital,* Burntwood, near Lichfield. Res. Med. Supt., J. B. Spence, M.D. Lichfield City, 3½ miles; Hammerwich, 1½ miles.

Limerick.—*District Asylum.* Res. Med. Supt., Dr. P. J. Irwin. Limerick station, ½ mile.

Lincoln.—*District Asylum,* Bracebridge. Res. Med. Supt., Dr. T. L. Johnston. 2½ miles from Lincoln G.N.R. station.

The Lawn, Lincoln. Res. Med. Supt., Arthur P. Russell, M.B. Lincoln station, 1 mile. *See also p. 602*

Liverpool.—*Shaftesbury House*, Formby, near Liverpool and Southport. Res. Med. Supt., E. S. Hayes Gill, M.B. Formby station, $\frac{1}{2}$ mile distant.

See also p. 586

Tue Brook Villa, Liverpool, E. Res. Med. Supts., Drs. Tisdall and Ingall. Tue Brook station or Green Lane car.

London.—*Bethlem Royal Hospital*, Lambeth Road, London, S.E. Phys. Supt., J. G. Porter Phillips, M.D., M.R.C.P.

See also p. 588

Bethnall House, Cambridge Road, N.E. Res. Med. Supt., J. K. Will, M.D. Cambridge Heath station.

Brooke House, Clapton, N.E. Res. Med. Supt., Dr. Gerald Johnston. Clapton, G.E.R.

Camberwell House, Peckham Road, S.E. 5. Res. Med. Supt., F. H. Edwards, M.D., M.R.C.P. Asst. Med. Offs., H. J. Norman, M.B., B.Ch., D.P.H., R. L. S. Nuthall, M.R.C.S. Tel.: 'Psycholia, London.' Telephone: New Cross, 1057.

See also p. 601

Chiswick House, Chiswick. Res. Lic., C. M. Tuke, M.R.C.S. Chiswick station, $\frac{1}{2}$ mile; Turnham Green station, 1 mile.

Clarence Lodge, Clapham Park, S.W. Prop., Mrs. F. Thwaites. Med. Off., Dr. Percy Smith. Clapham Road, and Clapham Common (Electric), 15 minutes. Tel. No. 494 Brixton. *See also p. 595*

Featherstone Hall, Southall (for ladies). Res. Med. Lic., W. H. Bailey, M.D. Southall station, 5 minutes.

Fenstanton, Christchurch Road, Streat-ham Hill. Res. Med. Supt., J. H. Earls, M.D. Tulse Hill, or Streatham Hill, 5 minutes.

Flower House, Catford, S.E. Res. Med. Supt., Dr. C. C. Bullmore. C. & D.R., Beckenham Hill, 5 minutes.

Halliford House, Sunbury-on-Thames, S.W. Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Sunbury station, $1\frac{1}{2}$ miles.

Hayes Park, Hayes, Middlesex. Res. Med. Off., Dr. H. F. Stilwell. Hayes, 2 miles.

Hendon Grove Asylum (for ladies), Hendon. Med. Lic., H. L. de Caux, L.M.S.S.A., L.S.A. (Lond.). By M.R., Hendon station, $\frac{1}{2}$ mile.

London County Colony (for Insane Epileptics), Epsom. Res. Med. Supt., —. L. & S.W. & L.B. & S.C.R., $1\frac{1}{2}$ miles.

London County Mental Hospital, Bantstead Downs, near Sutton, Surrey. Res. Med. Supt., Dr. P. C. Spark. Belmont station, $\frac{1}{2}$ mile; Sutton station, $1\frac{1}{2}$ miles.

London County Mental Hospital, Bexley, Kent. Res. Med. Supt., T. E. K. Stansfield, M.B. Bexley station, $1\frac{1}{2}$ miles.

London County Mental Hospital, Cane Hill, Coulsdon, Surrey. Res. Med. Supt., Lt.-Col. S. C. Elgee, L.R.C.P. & S.I. Coulsdon, S.E.R., or Coulsdon & Smitham Downs, L.B. & S.C.R., 10 minutes.

London County Mental Hospital, Clay-bury, Woodford Bridge, Essex. Med. Supt., G. Foster Barham, M.D. Woodford Bridge station, G.E.R., $1\frac{1}{2}$ miles.

See also p. 585

London County Mental Hospital, Colney Hatch, N. Res. Med. Supt., S. J. Gilfillan, M.A., M.B. New Southgate, G.N.R.

London County Mental Hospital, Hanwell. Med. Supt., A. W. Daniel, M.D.

London County Mental Hospital, Horton, Epsom. Res. Med. Supt., Dr. J. R. Lord. L. & S.W. Ry., $1\frac{1}{2}$ miles, L.B. & S.C.R., $1\frac{1}{2}$ miles.

London County Mental Hospital, Long Grove, Epsom. Res. Med. Supt., D. Ogilvy, M.D. L. & S.W.R. and L.B. & S.C.R.

London County Mental Hospital, The Manor, Epsom. Res. Med. Supt., Dr. E. S. Littelljohn. L. & S.W. and L.B. & S.C.R. *Mead House*, Hayes (for ladies). Med. Licensees, Dr. H. F. Stilwell and Dr. R. J. Stilwell.

Moorcroft House, Hillingdon, Uxbridge, 2 miles. Med. Licensees, Mr. J. F. Stilwell and Dr. R. J. Stilwell. West Drayton station, 2 miles.

Newlands House, Tooting Bec Common, S.W. 17. Prop. and Res. Phys., Dr. J. Noel Sergeant. Streatham Hill station, 1 mile. Motor bus No. 49. *See also p. 585*

Northumberland House, Green Lanes, N. Res. Med. Supt., Bernard Hart, M.D. Finsbury Park station, 1 mile.

See also p. 597

Otto House, 47, North End Road, West Kensington (for ladies). Lic. Prop., Mrs. Sutherland. Lady Supt., Miss Brodie. West Kensington station, 1 mile; Barons Court station (Piccadilly Tube), 1 mile.

See also p. 598

Peckham House, 112, Peckham Road, S.E. Props., A. H. & H. G. Stocker. Res. Med. Supt., Dr. F. R. King. Peckham Rye station, 10 minutes' walk.

See also p. 571

Springfield Mental Hospital, Tooting, S.W. Med. Supt., R. Worth, M.B., B.S. Wandsworth Common station, 1 mile.

St. Luke's Hospital for Mental Diseases, Old Street, E.C. (Offices, 19, Nottingham Place, W.)

The Priory, Roehampton, S.W., near Richmond Park. Res. Med. Supt., James Chambers, M.D. Barnes station, 10 minutes.

West Ham Mental Hospital, Goodmayes, Ilford. Res. Med. Supt., Dr. John Custance Shaw. Goodmayes, 1 mile.

Wood End House, Hayes (ladies). Med. Lic., Dr. R. J. Stilwell. Hayes station, 1 mile; Uxbridge, 3 miles.

Londonderry.—*District Asylum.* Res. Med. Supt., Dr. John Watson. Londonderry, 1 mile.

Macclesfield.—*Cheshire County Asylum,* Parkside, and "Uplands" for private patients. Res. Med. Supt., H. Dove Cormac, M.B., M.S. Macclesfield, 1 mile. *See also p. 602*

Maidstone.—*Kent County Asylum.* Res. Med. Supt., H. Wolseley-Lewis, F.R.C.S., M.D. Maidstone, 1½ miles.

Malling Place, West Malling, Kent. Res. Med. Supt., Dr. G. H. Adam. Malling station, 1 mile.

Market Lavington (Wilts.).—*Fiddington House.* Res. Med. Supt., J. R. Benson, F.R.C.E. Lavington, G.W.R., 1 mile; Devizes, 6 miles. *See also p. 601*

Maryborough (Queen's County).—*District Asylum.* Res. Med. Supt., Dr. P. Coffey. Maryborough, ½ mile.

Melrose, N.B.—*Roxburgh, Berwick, and Selkirk District Asylum.* Res. Med. Supt., Patrick Steele, M.D. Melrose, 1 mile.

Melton.—*St. Audry's Hospital for Mental Diseases,* near Woodbridge. Res. Med. Supt., J. R. Whitwell, M.B. Melton station, 1½ miles; Woodbridge station, 2½ miles.

Menston (near Leeds).—*West Riding Asylum.* Res. Med. Supt., S. Edgerley, M.D. Guiseley, 1 mile.

Merstham (Surrey).—*Surrey County Asylum,* Netherne. Med. Supt., Dr. P. C. Coombes. Coulsdon station, 2 miles.

Middlesbro'.—*Mental Hospital.* Res. Med. Supt., Dr. J. W. Geddes. Middlesbro', 2 miles.

Monaghan (Ireland).—*District Asylum.* Res. Med. Supt., Dr. T. P. Conlon. Monaghan, ¼ mile.

Montrose, N.B.—*Montrose Royal Lunatic Asylum.* Med. Supt., C. J. Shaw, M.D. Hillside, ¼ mile; Dubton, 1 mile.

Morpeth.—*Northumberland County Asylum.* Res. Med. Supt., Guy R. East, M.D., D.P.H. Morpeth station, 1 mile.

Mullingar.—*District Asylum.* Res. Med. Supt., Dr. Laurence Gavin. Mullingar station, 1 mile.

Newcastle-on-Tyne.—*City Asylum,* Gosforth. Med. Supt., H. D. MacPhail, M.D. Newcastle, 4 miles. (*Temporarily in use as a War Hospital.*)

Northampton.—*Berrywood Asylum.* Res. Med. Supt., W. Harding, M.D. Castle station, 2½ miles; Midland station, 3 miles.

St. Andrew's Hospital, Northampton. Med. Supt., D. F. Rambaut, M.A., M.D. (T.C. Dub.). Northampton station, 1 mile. *See also p. 589*

Norwich.—*Bethel Hospital for Mental Diseases.* Res. Med. Supt., S. J. Fielding, M.B. Cons. Phys., Saml. J. Barton, M.D. Norwich (Thorpe) station, 1 mile. *See also p. 592*

City of Norwich Mental Hospital, Hellesdon, near Norwich. Res. Phys. and Supt., Dr. David Rice. Hellesdon, 1 mile.

Heigham Hall, Norwich. Res. Med. Prop., J. G. Gordon-Munn, M.D. Thorpe station, 1½ miles.

Norfolk County Mental Hospital, Thorpe, Norwich. Res. Med. Supt., D. G. Thomson, C.B.E., M.D. Whittingham, 1 mile; Norwich, 2½ miles.

The Grove, Old Catton, near Norwich (for ladies). Res. Med. Supt., C. A. P. Osburne, F.R.C.S. Apply to the Misses McLintock.

Nottingham.—*City Asylum,* Mapperley Hill. Med. Supt., E. Powell, M.R.C.S.

Notts County Mental Hospital, Nottingham. Res. Med. Supt., S. L. Jones, M.R.C.S. Radcliffe-on-Trent, 2 miles.

The Coppice. Res. Med. Supt., David Hunter, M.B. (Camb.). Midland station, 2½ miles; Gt. Northern & Gt. Central station, 1½ miles. *See also p. 588*

Omagh.—*District Asylum.* Res. Med. Supt., Dr. John Patrick. Omagh station 2 miles.

Oxford.—*County and City Mental Hospital,* Littlemore. Res. Med. Supt., T. S. Good, M.R.C.S. Littlemore station. (*Temporarily in use as a War Hospital.*)

The Warneford, Oxford, 1½ miles. Res. Med. Supt., Alex. W. Neill, M.D. Oxford station, 2½ miles. *See also p. 595*

Paisley.—*Craw Road Asylum.* Res. Med. Off., Miss M. J. Gilmore-Cox, M.B., Paisley, 1 mile.

Paisley District Asylum, Riccartonbar. Med. Off., D. Fraser, M.D. Paisley West ½ mile.

Renfrew District Asylum, Dykebar, Paisley. Res. Med. Supt., R. D. Hotchkis, M.D. Paisley, 2½ miles.

Perth.—*District Asylum,* Murthly. Res. Med. Supt., Lewis C. Bruce, M.D.

James Murray's Royal Asylum, Perth (for patients of the middle and upper classes). Phys. Supt., D. Maxwell Ross, M.B., Ch.B. (Ed). Perth station, under 2 miles. *See also p. 593*

Plympton.—*Plympton House,* Plympton, South Devon. Res. Props., Dr. Alfred Turner and Dr. J. C. Nixon. Plympton, 1 mile; Marsh Mills, 2 miles; Plymouth, 5 miles. *See also p. 600*

Portsmouth.—*Borough Mental Hospital.* Res. Med. Supt., H. Devine, M.D. (Lond.). Clerk and Steward, John C. Kersey. Fratton, 1½ miles. *See also p. 596*

Prestwich (near Manchester).—*County Asylum.* Res. Med. Supt., Dr. F. Perceval. Prestwich, $\frac{3}{4}$ mile.

Rainhill (nr. Liverpool).—*County Asylum.* Res. Med. Supt., T. P. Cowen, M.D. St. Helens, $2\frac{1}{2}$ miles; Rainhill, 1 mile.

Rotherham (Yorkshire).—*The Grange,* 5 miles from Sheffield (for ladies). Con. Phys., W. C. Clapham, M.D. Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Grange Lane station, G.C.R., $\frac{1}{2}$ mile.

See also p. 595

St. Albans.—*Herts County Asylum,* Hill End. Med. Supt., A. N. Boycott, M.D. Hill End station, G.N.R., 2 minutes.

Napsbury Mental Hospital (under the Middlesex County Council), near St. Albans, Herts. Res. Med. Supt., L. W. Rolleston, M.B., B.S. Napsbury, M.R., 5 minutes' walk. (*Temporarily in use as a War Hospital.*)

St. Leonards-on-Sea.—*Ashbrook Hall,* Hollington (for ladies). Res. Lics., Mr. and Mrs. Charles E. H. Somerset. Warrior Square station, 2 miles.

Salisbury.—*Fisherton House Asylum.* Med. Supt., Dr. A. C. King-Turner. Salisbury station, L. & S.W. and G.W., 5 minutes.

Laverstock House, Salisbury. Res. Med. Supt., — — —. Salisbury, $1\frac{1}{4}$ miles.

Sevenoaks (Kent).—*Riverhead House* (for ladies). Res. Med. Supt., Dr. Hugh Munro. Sevenoaks station, S.E.R., $\frac{3}{4}$ mile.

Shrewsbury.—*Shropshire County Asylum.* Res. Med. Supt., W. S. Hughes, M.B., B.S. Shrewsbury station, $2\frac{1}{2}$ miles.

Sleaford.—*Kesteven County Asylum.* Med. Supt., J. A. Ewan, M.A., M.D. Rauceby, G.N.R., $\frac{1}{4}$ mile.

Sligo.—*District Asylum.* Res. Med. Supt., Dr. Joseph Petit. Sligo station, $1\frac{1}{2}$ miles.

Stafford.—*County Mental Hospital.* Res. Med. Supt., B. H. Shaw, M.D. Stafford, 1 mile.

Coton Hill Mental Hospital, Stafford. Res. Med. Supt., R. W. Hewson, L.R.C.S. & P. (Edin.). Stafford, 1 mile.

See also p. 585

Stirling.—*District Asylum,* Larbert. Med. Supt., Dr. R. B. Campbell. Larbert, $1\frac{1}{2}$ miles.

Stone (near Aylesbury).—*Bucks County Asylum.* Res. Med. Supt., H. Kerr, M.D. Aylesbury station, $3\frac{1}{4}$ miles.

See also p. 593

Talgarth.—*Brecon and Radnor Asylum.* Res. Med. Supt., R. Pugh, M.D.

Tamworth (Staffs.).—*The Moat House* (for ladies). Res. Licensees, Edward Hollins, M.A., and Mrs. S. A. Michaux. Tamworth station, $\frac{3}{4}$ mile.

Taunton.—*Somerset & Bath Asylum,* Cotford, near Taunton. Res. Med. Supt., Dr. H. T. S. Aveline. Norton Fitzwarren station, 2 miles.

Ticehurst (Sussex).—*Ticehurst House.* Res. Med. Supt., C. F. F. McDowall, M.D. Wadhurst, 4 miles, or Ticehurst Road, 3 miles.

Tonbridge.—*Redlands.* Res. Med. Supt., W. A. Harmer, L.S.A. Tonbridge junc., $2\frac{1}{2}$ miles.

Virginia Water.—*Holloway Sanatorium,* Hospital for the Insane, St. Ann's Heath. Res. Med. Supt., W. D. Moore, M.D. Asst. Med. Offs., T. E. Harper, L.R.C.P., C. Rutherford, M.B., and Ethelwyn M. Walters, M.B. Virginia Water station, 5 minutes. Seaside Branch, *St. Ann's,* Canford Cliffs, Bournemouth. Med. Off., C. E. C. Williams, M.D.

See also p. 598

Wadsley (near Sheffield).—*South Yorkshire Asylum.* Res. Med. Supt., W. J. N. Vincent, M.D., O.B.E. Wadsley Bridge, 1 mile; Sheffield, 4 miles. (*Temporarily in use as a War Hospital.*)

Wakefield.—*West Riding Asylum.* Res. Med. Supt., J. Shaw Bolton, M.D. Kirk-gate and Westgate station, 1 mile.

Wallingford (Berks.).—*Berkshire Asylum.* Res. Med. Supt., Edwin L. Dunn, M.B. Cholsey, 1 mile.

Warlingham (Surrey).—*Croydon Mental Hospital.* Res. Med. Supt., E. S. Pasmore, M.D. Upper Warlingham, $3\frac{1}{2}$ miles.

Warrington (Lancs.).—*Lancashire County Asylum,* Winwick. Warrington, $2\frac{1}{2}$ miles. (*Temporarily in use as The Lord Derby War Hospital,* Warrington. Lieut.-Col. A. Simpson, R.A.M.C., Administrator.)

Waterford.—*Carriglea.* Conducted by the Order of Bon Sauveur. Vis. Phys., Dr. J. W. Williams.

Waterford District Asylum. Res. Mod. Supt., Dr. Alexis FitzGerald. G.S. & W.R., North station, 2 miles.

Wells.—*Somerset and Bath Asylum* Wells, Som. Res. Med. Supt., Dr. G. Stevens Pope. Wells station, $1\frac{1}{2}$ miles.

Whitchurch (Salop).—*St. Mary's House.* Limited number of mild cases (ladies only). Res. Med. Supt., C. H. Gwynn, M.D. Whitchurch, 1 mile.

See also p. 576

Whitefield (near Manchester).—Overdale. Res. Phys., P. G. Mould, M.R.C.S. Prestwich and Whitefield station, 1½ miles.

Whittingham (near Preston).—County Asylum. Res. Med. Supt., Dr. J. F. Gemmel. Whittingham station, 3 mins.

Winchelsea (Sussex).—Peritau, near Hastings (for ladies). Physician, Harvey Baird, M.D. Winchelsea station, 1 mile.

Woking.—Surrey County Asylum, Brookwood. Res. Med. Supt., J. A. Lowry, M.D. Brookwood station, 1¼ mls.

Worcester.—County & City Asylum, Powick. Res. Med. Supt., Dr. G. M. P. Braine-Hartnell. Worcester station, 4 miles.

York.—Bootham Park Registered Hospital, York. Res. Med. Supt., G. R. Jeffrey, M.D. York station, 1 mile.

See also p. 602

The Pleasaunce (ladies only). Phys. Supt. and Res. Licensee, L. D. H. Baugh, M.B. York, 1½ miles. See also p. 594

The Retreat, York. Res. Med. Supt., Bedford Pierce, M.D., F.R.C.P. (Lond.). York station, 1½ miles. Also *Throxenby Hall*, a branch house, near Scarborough.

See also p. 599

North Riding of Yorkshire Asylum, Clifton. Res. Med. Supt., A. I. Eades. York, 2 miles.

York City Asylum, Fulford, York. Res. Med. Supt., Dr. C. L. Hopkins. Naburn, ½ mile.

MENTAL DEFICIENCY ACT, 1913: CERTIFIED INSTITUTIONS AND HOUSES.

Class A.—Certified Institutions. *Class B.*—Institutions approved under Section 37.

Class C.—Certified Houses. *Class D.*—Approved Homes.

BUCKINGHAMSHIRE.

Winslow Union Workhouse, Winslow.—20 male, 20 female, adults. Feeble minded and imbecile. Managers, Winslow Board of Guardians. (*Class B.*)

CHESHIRE.

Sandlebridge, near Alderley Edge.—295 males and females. Life care is provided, but only educable mentally defective children under 13 years of age are eligible for admission. Managers, Incorporated Lancashire and Cheshire Society for the Permanent Care of the Feeble Minded. Sec., E. M. Richards, 1, Brazenose Street, Manchester. (*Class A.*)

CORNWALL.

The Elizabeth-Barclay Home, Bodmin.—26 females. Matron, Miss E. Hunt; Hon. Sec., Miss E. M. S. Shaw, Roslyon, Bodmin. (*Class D.*)

CUMBERLAND.

Durran Hill House, Carlisle.—65 females. Feeble minded. Higher Grade. Sec., T. W. Hunter, Archbishop's House, Westminster, S.W. 1. Supt., Sister E. Ring. (*Class A.*)

DERBYSHIRE.

Hopwell Hall, Ockbrook.—50 males. Sec., Mrs. Kipling, 40, Magdala Road, Nottingham. (*Class A.*)

Whittington Hall, Whittington, near Chesterfield.—400 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control, 14, Howick Place, Victoria Street, S.W. 1. (*Class A.*)

DEVON.

Western Counties Institution, Starcross.—400 males and females (trainable children). Sec. Supt., E. W. Locke. (*Class A.*)

DORSET.

Kingsgate and Frithstow, West Moors Wimborne.—12 females. Supt., Miss A. H. Egan. (*Class D.*)

DURHAM.

Monkton Hall Home for Lads, Jarrow-on-Tyne.—48 males. Sec., J. Stewart, 90, Pilgrim Street, Newcastle. (*Class A.*)

ESSEX.

Bigods Hall, near Dunmow.—For males. Corresponding Manager, Rt. Rev. Mgr. Wm. O'Grady, St. George's, Walthamstow, E. 17. (*Class A.*)

Ethoe House, Church Road, Leyton.—122 females. Feeble minded, over 16. Managers, The Sisters of the Sacred Hearts of Jesus and Mary, Church Road, Leyton. (*Class A.*)

Tendring Institution, Weeley, Essex.—26 males, 26 females. Managers, Guardians of the Tendring Union. H. J. Burden, Superintendent. (*Class A.*)

Royal Eastern Counties Institution, Colchester.—640 males and females, all grades. Managers, The Board of Directors. Address communications to the Medical Superintendent. (*Class A.*)

The Co-operative Sanatorium, Billericay.—56 males of the middle class. Managers, The Co-operative Sanatoria, Ltd. (*Class A.*) See also p. 573

Gay Bowers, West Hanningfield, Chelmsford.—7 males. Manager, Mrs. Chennells. (*Class D.*)

FLINTSHIRE.

Walmer School for the Blind and Blind Deaf, Rhyl.—13 males and females. Feeble minded. Managers, Mrs. and Miss Roberts. (Class D.)

GLOUCESTERSHIRE.

Brentry Certified Institution, Westbury-on-Trym, Bristol.—119 males, 11 females. Res. Supt., T. R. Lambert; Med. Off., Dr. Ormerod. Hon. Sec., Rev. H. N. Burden. Clifton Down, Redland, or Patchway stations, $3\frac{1}{2}$ miles. (Class A.)

Poor Law Institution, Stapleton.—12 males, 17 females. Managers, Bristol Board of Guardians. Superintendent, L. W. Williams. (Class A, B, C, and D.)

St. Mary's Home, Painswick, near Stroud.—26 females. High grade feeble minded. Supt., Mrs. H. Oddy. (Class A.)

Stoke Park Colony, Hanham Hall, Hanham, near Bristol.—240 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stoke Park Colony, Royal Victoria Home, Horfield.—42 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Stoke Park Colony, Stapleton, Bristol.—750 patients of both sexes (not exceeding 650 females or 300 males). Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.) See also p. 568

Stoke Park Colony, West Side, Stapleton.—178 males. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Royal Fort Home, Bristol.—15 females, high grade mentally deficient. Managers, Ladies' Committee. Hon. Sec., Miss Savill, 7, Woodland Road, Tyndall's Park. (Class D.)

HAMPSHIRE.

St. Mary's Home, Alton.—45 mentally and morally deficient females. Managers, The Wantage Community of Sisters. (Class A.)

Poor Law Institution, Parkhurst, Isle of Wight.—3 males, 5 females. Supt., J. Mekeown. Managers, Isle of Wight Board of Guardians. (Class B.)

HERTS.

Hillside Special School for Mentally Defective Boys, Buntingford.—43 males. Secretary, T. W. Hunter, Archbishop's House, Westminster, S.W. 1. (Class A.)

St. Elizabeth's Home for Epileptics, Much Hadham.—136 males and females. Apply to T. W. Hunter, Archbishop's House, Westminster, S.W. 1. (Class A.)

Rouley Lodge, Rowley Green, Barnet.—Supt., Miss Paetow. (Class C.)

KENT.

Princess Christian's Farm Colony, Hildenborough.—68 males, 68 females. Managers, National Association for the Feeble Minded. Superintendent, Miss Pitman. (Class A and D.)

LANCASHIRE.

Allerton Priory, R.C. Special Industrial School, Woolton, Liverpool.—106 male and female educable children. Superintendent, Sister Flannery. (Class A.)

Brockhall, Whalley, near Blackburn.—283 females. Feeble minded, imbeciles, and moral imbeciles. Managers, Mental Deficiency Acts Committee, Lancashire Asylums Board, Preston. (Class A.)

Pontville, R.C. Special School, Ormskirk.—106 boys. Mentally defective. Managers, Sisters of the Sacred Hearts of Jesus and Mary. Correspondent, Right Rev. Monsignor Canon Pinnington, 109, Great Mersey Street, Liverpool. (Class A.)

Royal Albert Institution, Lancaster.—461 males, 289 females. Managers, The Central Committee of the Royal Albert Institution, Lancaster. (Class A.)

See also p. 568

Seafeld House, Waterloo Road, Seaforth, near Liverpool.—210 males and females. Managers, Guardians of the West Derby Union, Liverpool. (Class B.)

Linthal, Freshfield, Liverpool.—Males only. Manager, Miss Bowyer. (Class C.)

LEICESTERSHIRE.

Cross Corners, Loughborough Road, Leicester.—26 females. Feeble minded. Managers, Leicester Corporation Mental Deficiency Committee. Clerk, C. F. Smith, Alliance Chambers, Horsefair Street, Leicester. (Class A.)

LONDON.

Clifton House, 127, Uxbridge Road, Shepherd's Bush, W.—40 females. Feeble minded and moral imbeciles. Managers, The Church Army, Bryanston Street, W. (Class A.)

39, Downs Road, 41, Downs Road, 46-48, Pembury Road, Clapton, E.—80 females. Managers, Committee of Girls' Training Homes, Clapton. (Class A.)

Springfield Lodge, Grove Hill Road, Denmark Hill.—28 females. Managers, Salvation Army. (Class A.)

The Helping Hand Home, 16, Cathcart Hill, N.—30 females. High grade mentally deficient. Managers, Committee; Hon. Sec., Mrs. Geoffrey Russell, 39, Mecklenburgh Square, W.C. (Class A.)

Kensington Workhouse.—60 females. Managers, Guardians of the Poor of the Parish of St. Mary Abbots, Kensington. Supt., Mr. Francis Birch. (Class B.)

Woolwich Workhouse, Plumstead, S.E.—25 males, 45 females. Temporary. Sent by L.C.C. only. Managers, Board of Guardians of the Woolwich Union. E. G. Manning, Supt. (Class B.)

MIDDLESEX.

All Souls' Special School, Field Heath House, Hillingdon.—89 females. Educable and imbeciles. Manager, T. W. Hunter, Archbishop's House, Westminster, S.W. 1. (Class A.)

Bramley House, Clay Hill, Enfield.—45 females. Managers, Committee for the Care of the Mentally Defective, Middlesex County Council. (Class A.)

Crathorne, Oak Lane, East Finchley, N.—32, consisting of women with their infants. Managers, Northern Heights Branch of the National Association for the Feeble Minded; Hon. Sec., Mrs. Moss-Blundell, 7, North Grove, Highgate, N. 6. (Class A.)

Enfield House, 19, Chase Side Crescent, Enfield, Middlesex.—40 males. Managers, Guardians of Edmonton Union. Superintendent, E. B. Willett. (Class A.)

Warkworth House, Isleworth.—38 boys. Managers, Middlesex County Council. Supt., S. F. Rowbotham. (Class B.)

Armiston, The Grove, Isleworth.—10 males under 14, 10 females. Managers, Misses J. M. and M. D. Isbister. (Class C.)

Normansfield, Hampton Wick.—120 males and females. Manager, Dr. R. L. Langdon-Down. (Class C.) See also p. 572

The Gables, Upper Teddington Road, Hampton Wick.—18 male and female children. Manager, Miss Frances M. Deck. (Class C.)

Alexander House, 117, High Street, Uxbridge.—24 females over 16. Managers, Committee. Supt., Miss E. Collyer. (Class D.)

Conifers, Hampton Wick.—16 females, and 3 male children. Manager, Dr. R. L. Langdon-Down. (Class D.)

Trematon, Hampton Wick.—18 males. Manager, Dr. R. L. Langdon-Down. (Class D.)

NORFOLK.

The Lodge, Bowthorpe Road, Norwich.—6 males, 20 females. Managers, The Guardians of the Poor of the Norwich Incorporation. (Class B.)

The Oileys, Seething, Norwich.—30 females, children and girls. Superintendent and Proprietress, Miss S. A. Huntly. (Class D.)

NORTHUMBERLAND.

Prudhoe Hall Colony, Prudhoe.—185, all classes. Managers, Northern Counties Joint Poor Law Committee. Clerk, J. W. Coulson, Poor Law Offices, South Shields. (Class B.)

Home of Industry, Bow Villa, Morpeth.—16 females. Feeble minded. Superintendent, Miss A. Pawsey. (Class D.)

OXFORDSHIRE.

Cumnor Rise, Oxford.—43 females. High-grade feeble-minded. Managers, Committee. Hon. Secretary, Honble P. Bruce. (Class A.)

SOMERSET.

Stoke Park Colony, Leigh Court, Abbot's Leigh, nr. Bristol.—260 females. Managers, The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

Rock Hall House, Combe Down, Bath.—18 males, 19 females. Supt., Miss J. Quinton. (Class A.)

Long Ashton Poor Law Institution, Flax Bourton, near Bristol.—5 males, 5 females. Managers, Guardians of the Long Ashton Union. (Class B.)

STAFFORDSHIRE.

Burton-on-Trent Poor Law Institution.—5 males, 2 females. Managers, Guardians Burton Union. Master, R. Bareham. (Class A.)

New Cross Institution, Mental Wards, Wolverhampton.—1 male, 2 females. Cases accepted only from Wolverhampton County Borough Council. Supt., T. D. Rollinson. (Class A.)

Poor Law Institution, Dudley, Stafford.—50 males, 50 females. Managers, Guardians of the Dudley Union. (Class A.)

SUFFOLK.

Handford Home, Ranelagh Road, Ipswich.—20 females. Supt., Mrs. A. Turner. (Class A.)

St. Joseph's Home, Sudbury.—14 females. Manager, Rev. W. Wainwright. (Class A.)

SURREY.

Croydon Union House, Queen's Road, Croydon.—20 males, 3 females. Managers, Croydon Board of Guardians. (Class A.)

Royal Earlswood Institution, Redhill.—650. Managers, Board of Management. (Class A.)

SUSSEX.

Avonhurst, Burgess Hill.—20 private cases only, males and females under 16. Manager, Miss S. M. Macdowall. (Class C.)

Hastings and St. Leonards Special School for Blind and Partially Blind Children who are also Mentally Defective, Backward, or Exceptional.—Manager, Principal and Committee. See also p. 568

St. Paul's House, Upper Maze Hill, St. Leonards-on-Sea.—For delicate, backward, or exceptional pupils. School for juniors in separate house and grounds. Supt., Mrs. J. Meiklejon. (Class D.) See also p. 571

WARWICK.

Agatha Stacey Homes, Rednal, near Birmingham.—40 females; and *Ennis-kerry, Knowle, Warwickshire.*—24 females. Managers, The Central Committee, 158, Broad Street, Birmingham. (Class A.)

Midland Counties Institution, Knowle, near Birmingham.—89 males, 42 females. Managers, The Committee. Superintendent, A. H. Williams. Medical Officer, J. O. Hollick, M.B. (Class A.)

Monyhull Colony, King's Heath, Birmingham.—318 males, 303 females. Managers, Guardians of the Poor of the Birmingham Union. Clerk and Solicitor, Sir James Curtis, Union Offices, Edmund Street, Birmingham. (Class A.)

WILTS.

Devizes Union Home.—9 females. Managers, Devizes Board of Guardians. (Class A.)

Pewsey Union Workhouse, Pewsey.—4 females. Managers, Pewsey Board of Guardians. Supt., H. England (Class B.)

Poor Law Institution, Semington, near Trowbridge.—6 males, 24 females. Managers, Guardians Trowbridge and Melksham Union. Supt., C. H. Taylor. (Class B.)

WORCESTERSHIRE.

Besford Court Home, near Defford.—Supt., Rev. T. A. Newsome. (Class A.)

Evesham Union Workhouse.—Certified only for dealing with cases arising in the Evesham Union Area. Superintendent, J. H. Damen (Class A.)

YORKSHIRE.

Mid-Yorkshire Institution, Whitley, York.—90 males, 50 females. Managers, The Mid-Yorkshire Joint Board. Supt., Capt. J. Brown, I.S.O. (Class A.)

The Grange, Altofts, Normanton.—15 females, good class. Mentally deficient, epileptics. Manager, Mrs. E. A. Howard. (Class C)

INSTITUTIONS FOR INEBRIATES.

LICENSED UNDER THE ACTS, 1879-1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an 'Inebriate' within the meaning of the Acts.

* NOTE.—Ashford is a Roman Catholic Religious Institution.

† Terrington St. Clement, and Torquay are C.E.T.S. Institutions.

MALES ONLY.

Folkestone.—*Capel Lodge*, near Folkestone. Res. Prop., E. Norton, M.D. Folkestone Junction, 2 miles.

Rickmansworth (Herts).—*Dalrymple House.* Apply to Res. Med. Supt., Dr. F. S. D. Hogg. Rickmansworth station, Gt. Central & Metropolitan Rlwy, $\frac{1}{2}$ mile; L. & N.W.R., 1 mile. See also p. 575

FEMALES ONLY.

*Ashford (Middlesex).** —*Ecclesfield.* Med. Supt., Dr. M. F. Cock. Apply, Mother Superior. Ashford station, 1 mile. See also p. 575

Belfast.—*The Lodge Retreat*, Irwin Avenue, Strandtown. Med. Attendant, R. W. Leslie, M.D. Bloomfield station, 5 mins. walk.

Beverley (E. Yorks).—*Albion House.* Med. Supt., Dr. George Savage. Hon. Sec., Mrs. T. R. Pentlith, The Limes, Sutton-on-Hull.

Leicester.—*Melbourne House.* Principal, Mr. H. M. Riley. Med. Attendant, R. Sevestre, M.A., M.D. Camb. Station, 2 miles.

Newmains (N.B.).—*Newmains Retreat* for ladies. Hartwood station, Cal. Railway, 2 miles.

Reigate (Surrey).—*Duxhurst*, for women of all classes. Under the Superintendence of Lady Henry Somerset. Med. Supt., A. Walters, M.R.C.S. Reigate, 4 miles.

Spelthorne St. Mary (Bedfont, Middlesex).—Apply to the Sister Superior C.S.M.V. Med. Supt., Dr. H. W. Newton. Feltham, S.W.R., 1 mile.

Terrington St. Clement† (Norfolk).—*Hamond Lodge.* Res. Supt., Miss Yolland. Med. Supt., S. R. Lister, M.R.C.S. Terrington station, 1½ miles.

Torquay.†—*Temple Lodge.* Res. Supt., Sister in Charge. Med. Off., W. Odell, F.R.C.S.

UNLICENSED HOMES.

Beckenham (Kent).—*Norwood Sanatorium*. The Mansion, Bockenham Park. Med. Supt., F. Hare, M.D. Beckenham Junc. station, 10 mins. See also p. 576

Dublin.—*Farnham House*, Finglas. Res. Med. Supt., H. P. D'Arcy Benson, M.D. Dublin, 2 miles. See also p. 575

Lasswade, Midlothian.—*Craufurd Bank* Temperance Home for Women. Hon. Sec., Miss Cook, 27, Regent Terrace, Edinburgh.

London.—*London Sanatorium*, 150, Harley Street, W. Res. Med. Supt., C. A. McBride, M.D.

SANATORIA FOR CONSUMPTION AND OTHER FORMS OF TUBERCULOSIS.

Aberchaldor (N.B.).—*Inverness-shire Sanatorium*. Med. Supt., D. S. Johnston, M.D. Aberchaldor, 2 miles.

Aysgarth, S.O. (Yorks).—*Wensleydale Sanatorium*. Physicians, D. Dunbar, M.B., B.S., and W. N. Pickles, M.D., B.S. Aysgarth, $\frac{1}{2}$ mile, via Northallerton, N.E.R. and Hawes Junction, M.R.

See also p. 574

Banchory (Scotland).—*Nordrach-on-Dee*. Res. Phys., D. Lawson, M.A., M.D. Banchory, $1\frac{1}{2}$ miles.

Barrasford (Northumberland).—*The Newcastle-on-Tyne and Northumberland Sanatorium*. Res. Med. Supt., Dr. C. G. R. Goodwin. Barrasford, N.B.R., $3\frac{1}{2}$ miles.

Benenden (Kent).—*Sanatorium of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis."* Res. Med. Supt., Niven Robertson, M.D. Biddenden, 3 miles.

Bingley (Yorks.).—*Eldwick Sanatorium* (school for phthisical children). Med. Off., Dr. Margaret S. Sharp. Bingley station, 2 miles.

Birmingham (near).—*Romsley Hill Sanatorium*, Halesowen. Res. Med. Off., Dr. P. Allan. Hunnington, Mid. & G.W.R., 2 miles.

Bolton (Lancs.).—*Wilkinson Sanatorium for Consumptives*, Sharples. Med. Off., Dr. J. D. Marshall.

Bournemouth.—*Royal National Sanatorium for Consumption and Diseases of Chest*. Sec., A. G. A. Major. Res. Med. Off., W. Bertram Lawrence. Bournemouth Central, $1\frac{1}{2}$ miles; Bournemouth West, $\frac{1}{2}$ mile.

The Firs Home (for advanced cases). Hon. Secs., Col. R. F. Anderson and Dr. Willes, Bournemouth. Hon. Med. Offs., C. P. Woodstock, M.D., and S. G. Champion, M.D. Lady Supt., Miss Ingram. Bournemouth Central, $\frac{1}{2}$ mile.

The Home Sanatorium, West Southbourne, near Bournemouth. Res. Med. Supt., J. E. Esslemont, M.B., Ch.B. Bournemouth Central, $2\frac{1}{2}$ miles; Boscombe, $1\frac{1}{2}$ miles; Christchurch, $2\frac{1}{2}$ miles.

Bridge of Weir (Renfrewshire).—*Consumption Sanatoria of Scotland*. Hon. Treas., Sir Joseph P. Maclay, Bart., 21, Bothwell Street, Glasgow. Res. Med. Supt., James Crockett, M.D. Bridge of Weir, 2 miles.

Brighton.—*Municipal Sanatorium*, for Brighton townfolk only (pulmonary and joints). Med. Supt., Dr. Duncan Forbes, M.O.H. for Brighton. Particulars, Town Hall, Brighton.

Chagford (Devon).—*Dartmoor Sanatorium*. Res. Med. Supt., Dr. C. H. Berry. Moretonhampstead, G.W.R., 6 miles.

Chelmsford (Essex).—*Great Baddow Sanatorium*. Med. Supt., A. Lyster, M.D. Chelmsford, G.E.R., 4 miles.

Cheltenham.—*Cranham Lodge Sanatorium*, Stroud, Glos. Res. Med. Supts., A. H. Hoffman, M.D., and Geoffrey A. Hoffman, M.B. Cheltenham, 8 miles.

Salterley Grange Sanatorium, near Cheltenham. Res. Med. Supt., Dr. E. G. Glover. Leckhampton, $2\frac{1}{2}$ miles; Cheltenham, $3\frac{1}{2}$ miles.

Chesterfield (Derbyshire).—*Ashover Sanatorium*. Res. Med. Supt., Dr. James Wall. Stretton, M.R., $3\frac{1}{2}$ miles; Matlock, 4 miles.

Darlington.—*Felix House*, Middleton St. George, Co. Durham. Res. Med. Supt., C. S. Steavenson, M.B. Dinsdale, N.E.R., 3 minutes.

Devon and Cornwall Sanatorium, Didworthy, South Brent. For consumptives of the two counties. Sec., S. Carlile Davis, Esq., 5, Princess Square, Plymouth. Res. Med. Supt., Dr. W. B. Livermore. Brent, G.W.R., 2 miles.

Doneraile (Co. Cork).—*Cork County and City Sanatorium*, Heatherside. Res. Med. Supt., Dr. R. Ahern. Buttevant, G.S. & W.R., 5 miles.

Dublin. — *Peamount Sanatorium*, Hazelhatch, Dublin. Med. Supt., A. H. Hanley, C.M.G., F.R.C.S.I. Lucan or Hazelhatch, Gt. Southern Railway.

Dundee (near).—*Sidlaw Sanatorium*. Med. Supt., H. E. Fraser, M.D., Royal Infirmary, Dundee. Auchterhouse station, 1½ miles.

Durham.—*Durham County Consumption Sanatoria*. Sec., Mr. F. Forrest, 54, John Street, Sunderland. For men: Stanhope, Med. Supt., Lieut.-Col. John Gray, R.A.M.C. Stanhope station, 1 mile. For women and children: Wolsingham, Med. Supt., Dr. Menzies. Wolsingham station, ¾ mile.

Edinburgh.—*Royal Victoria Hospital for Consumption*. Under the Corporation of the City of Edinburgh, and the supervision of the Public Health Department, City Chambers, Edinburgh.

Fortbreda, Belfast.—*Forster Green Hospital for Consumption and Chest Diseases*. Sec., J. Osborne, 2, Wellington Place, Belfast. Borne, 2 miles.

Frimley (Surrey).—*Brompton Hospital Sanatorium*. Res. Med. Supt., Dr. R. C. Wingfield. Frimley station, 2 miles.
See also p. 560

Grange-over-Sands. — *Westmoreland Sanatorium*, Meathop. Res. Med. Supt., C. F. Walker, M.D. Grange-over-Sands station, 2¾ miles.

Hastings. — *Fairlight Sanatorium*, in connection with Margaret Street Hospital for Consumption (for Out-Patients), 26, Margaret St., W. Sec., Mrs. M. C. Hawthorne. Med. Off., Dr. N. F. Stallard. Hastings, tram, about 15 minutes.

Heswall (Cheshire).—*West Derby, Liverpool, and Toxteth Park Joint Sanatorium for Children*. Med. Supt., J. B. Yeoman, M.D. Matron, Miss Bateson. Heswall, 1½ miles.

Hull.—*Hull and East Riding Convalescent Home*, Withernsea. Sec., Benjamin Brooks, Royal Infirmary, Hull. Med. Off., A. E. Sproule, L.R.C.P. Withernsea station.

Isle of Wight.—*Royal National Hospital for Consumption*, Ventnor. Senr. Res. Med. Off., Dr. D. Morrison Smith. Sec., Charles W. Cox, 18, Buckingham Street, Strand, W.C. Ventnor, 1 mile.

St. Catherine's Home, Ventnor (for early cases of phthisis in children). Apply Sister-in-Charge. Med. Off., H. F. Bassano, M.A., M.B. Ventnor, 5 minutes' drive.

Kingussie (Inverness-shire).—*Grampian Sanatorium*. Med. Supt., — — —.

Kirkcaldy.—*Sanatorium for Consumption*. Med. Supt., Dr. G. W. McIntosh. Sec., The Town Clerk. Kirkcaldy, 1 mile.

Lanark.—*City of Glasgow Sanatorium*, Bellefield, Lanark. Phys. Supt., Dr. J. W. Allan. Lanark, 20 minutes.

Lanchester (Durham).—*Maiden Law Sanatorium*. Med. Off., Dr. W. M. Morison. Sec., W. H. Ritson. Annfield Plain station, 1 mile.

Lancing-on-Sea, Worthing. — *Southern Convalescent Homes and Sanatorium*. Med. Off., A. E. Rouse, L.R.C.P. Sec., W. Chorley, 68, Grosvenor Road, Canonbury, N. 5 *See also p. 573*

Leeds.—*Leeds Sanatorium for Consumptives*, Gateforth, near Selby, and *Leeds Hospital for Consumptives*, Armley. For poor of Leeds. Sec., C. H. Sedgwick, 37, Great George Street, Leeds.

Leysin-Feydey (Switzerland). — Four Sanatoria for the treatment of pulmonary tuberculosis. *See also p. 574*

Liverpool.—*Liverpool Sanatorium for Consumptives*, Kingswood, Frodsham. Sec., Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., Alfred Adams, M.D. Frodsham, L. & N.W.R., 3½ miles.

Park Hill Sanatorium, Liverpool. Med. Supt., H. R. Macintyre, M.D.

Llanybyther (Carmarthenshire).—*West Wales Sanatorium*. The Welsh National Memorial to King Edward VII. Act. Res. Med. Supt., Dr. D. C. Lloyd. Llanybyther station, 3 miles.

London.—*City of London Hospital for Diseases of Chest*, Victoria Park, E. 2. Apply, Secretary. Cambridge Heath, G.E.R., Bus or Tram, 5 mins.

Mount Vernon Hospital for Consumption and Diseases of the Chest, Northwood. Northwood (Met. & G.C. Rly.). Res. Phys., Dr. W. G. Kinton. Out-patient department, 7, Fitzroy Square, W. Secretary, W. J. Morton.

Royal Chest Hospital, 231, City Road, E.C. Apply to the Secretary.

Long Stratton (Norfolk).—*Fritton Sanatorium*. Med. Director, Dr. Annie McCall, 165, Clapham Road, S.W. Forncett station, G.E.R., 4 miles.

Manchester.—*Hospital for Consumption and Diseases of Throat and Chest*, Bowdoin ; *Crossley Sanatorium*, Delamere, Cheshire. (For poor and working classes, after personal examination at Manchester.) Sec., C. W. Hunt, Manchester.

Margate (Kent).—*Royal Sea-bathing Hospital* (for Surgical Tuberculosis). Sec., A. Nash, 13, Charing Cross, S.W. Margate West, $\frac{1}{2}$ mile.

Matlock (Derbyshire).—*Matlock Sanatorium*. Med. Supt., Dr. F. Kincaid.

Mendip Hills.—*Mendip Hills Sanatorium*, Wells, Somerset. Res. Phys., D. J. Chowry Muthu, M.D. Wells station, 3 miles. See also p. 569

Nordrach-upon-Mendip, Blagdon, nr. Bristol. Med. Supts., R. Thurnam, M.D., and Dr. D. Kennedy (Resident). Burring-ton station, 5 miles.

Midhurst (Sussex).—*King Edward VII Sanatorium*. Res. Med. Supt., Dr. H. O. Blanford. Midhurst, 4 miles.

Murtle (Aberdeenshire).—*Tor-na-Dee Sanatorium*. Res. Med. Supt., Dr. Ian Struthers Stewart. Murtle, $\frac{1}{2}$ mile.

Nayland (Suffolk).—*East Anglian Sanatorium*, with *Malings Farm Sanatorium* for poorer men and women patients, and *East Anglian Children's Sanatorium* and *Training Centre*, Nayland. Med. Supt., Dr. Jane Walker, 122, Harley Street, W. Bures station, G.E.R., $3\frac{1}{2}$ miles.

New Cumnock (Ayrshire).—*Ayrshire Sanatorium*, Glenafton. Res. Med. Supt., E. E. Prest, M.D. New Cumnock, 3 miles.

Norfolk.—*Kelling Sanatorium*, Holt. Res. Med. Supt., Dr. J. I. W. Morris. Holt, $1\frac{1}{2}$ miles.

Mundesley Sanatorium, Mundesley. Res. Phys., S. Vere Pearson, M.D. Mundesley, 1 mile.

Northampton.—*Northamptonshire Sanatorium*, Creaton. Res. Med. Supt., Dr. Edward Bigg. Brixworth, L. & N.W.R., 3 miles.

Nottingham.—*Ransom Sanatorium*, Sherwood Forest, Mansfield. Res. Med. Off., Dr. R. R. S. Weatherston. Mansfield, 3 miles.

Oban, Scotland.—*Argyll County Sanatorium*. Vis. Med. Off., Duncan Mac-Donald, M.D. Oban, 1 mile.

Peebles.—*Manor Valley Sanatorium*. Med. Off., C. B. Gunn, M.D. Peebles, 4 miles, Lyne, 2 miles.

Penmaenmawr (N. Wales).—*Pendyffryn Hall Sanatorium*. Res. Phys., Dr. G. M. Geraty.

Peppard Common (Oxon).—*Berks. and Bucks. Joint Sanatorium*. Res. Chief Med. Off., Dr. Esther Carling. Reading, $6\frac{1}{2}$ miles.

Ringwood (Hants).—*Linford Sanatorium*. Res. Phys., H. G. Felkin, M.D., A. de W. Snowden, M.D., and H. A. F. Wilson, M.R.C.S. Ringwood sta., $2\frac{1}{2}$ mls.

Rudgwick (Sussex).—*Rudgwick Sanatorium*. Vis. London Phys., Dr. Annie McCall, 165, Clapham Road, S.W. Rudgwick station, 5 minutes.

Ruthin (N. Wales).—*Vale of Clwyd Sanatorium*, *Llanbedr Hall*. Res. Med. Supt., H. Morriston Davies, M.D. Ruthin station, 2 miles. See also p. 574

St. Leonards.—*Eversfield Chest Hospital*, West Hill. Res. Phys., T. Gambier, M.D. West St. Leonards, S.E.R., West Marina, L.B. & S.C.R., within 5 minutes' walk.

Sandon, near Chelmsford (Essex).—*Merivale Sanatorium*. Res. Phys., H. N. Marrett, M.R.C.S. Chelmsford station, G.E.R., $3\frac{1}{2}$ miles. See also p. lxxi

Sheffield.—*City Hospitals and School for Consumptives*, Crimicar Lane (for males); *Commonside* (for females). Med. Supt., H. J. E. H. Williams, M.D.

Shirlett, near Broseley (Shropshire).—*King Edward VII Memorial Sanatorium*. Med. Supt., Dr. T. R. Elliott. Much Wenlock station, 3 miles.

Skipton (Yorks).—*Eastby Sanatorium*. Res. Med. Supt., Dr. Catherine Arnott. Embay station, 2 miles.

Stannington (Northumberland).—*"Philipson" Children's Sanatorium*. Matron, Miss J. M. Campbell. Two Vis. Physicians. Stannington station, 3 miles.

Threlkeld (Cumberland).—*Blencathra Sanatorium*. Res. Med. Supt., Dr. W. Goodchild. Threlkeld, C.K. & P.R., 2 m.

Torquay.—*Western Hospital for Incipient Consumption*, Torquay. (Temporarily closed.) Sec., W. F. Manley.

Warrenpoint (Co. Down).—*Rostrevor Sanatorium*. Vis. Phys., B. H. Steede, M.D. Apply Secretary. See also p. 569

Wicklow.—*The Royal National Hospital for Consumption for Ireland*, Newcastle, Wicklow. Res. Med. Off., C. Denys Hanan, M.D. D. & S.E.R. to Newcastle, Co. Wicklow, 3 miles.

Winsley, near Bath.—*Winsley Sanatorium*. Senr. Res. Med. Off., Dr. H. W. M. Rees. Sec., Frederic Jones. Limpley Stoke station, 1 mile.

Worcester (near).—*Knightswick Sanatorium*. Res. Med. Supt., Dr. H. Gordon-Smith. Knightswick, G.W.R., $1\frac{1}{2}$ miles.

HYDROPATHIC ESTABLISHMENTS.

Baslow (Derbyshire).—*Grand Hotel and Hydro.* Apply Manager.

Ben Rhydding (Yorkshire).—*Ben Rhydding Hydro.* Phys., Dr. W. R. Bates. Station, a few hundred yards.

Birmingham.—*The City Hydropathic and Massage Establishment*, 275, Broad Street. Proprietor, Robert Schenkel (*Swiss*).

See also p. 577

Bournemouth (Hampshire).—*Bournemouth Hydropathic.* Res. Phys., W. J. Smyth, M.D. East station, $1\frac{1}{2}$ miles; West station, $\frac{1}{4}$ mile.

Durley Dean Hydro. Bournemouth. Manager, W. J. Evans.

Linden Hall Hydro. Bournemouth. Apply Manager.

Bristol.—*The Bristol Hydropathic*, College Green. Res. Phys., W. J. Spoor, M.B., M.R.C.S. Temple Meads, $1\frac{1}{2}$ miles.

Bute.—*Kyles of Bute Hydropathic*, Port Bannatyne, Rothesay. Man., A. Menzies. Clyde steamers call daily.

Buxton.—*Buxton Hydro Hotel.* Manager, G. W. Bosworth. Station, 4 mins.

Haddon Hall Hydro. Buxton. Proprietress, Mrs. G. E. Hall.

Caterham (Surrey).—*Caterham Sanitarium and Hydropathic.* Med. Supt., Dr. F. C. Shone. Caterham station.

Clifton (near Bristol).—*Clifton Grand Spa Hotel and Hydro.* Clifton Down station, 1 mile; Bristol station, $1\frac{1}{2}$ miles.

Cork.—*St. Ann's Hill Hydropathic.* Res. Med. Supt., Dr. R. H. Barter, O.B.E. Blarney station, $2\frac{1}{2}$ miles; Cork, 8 miles.

Crieff.—*Strathearn Hydro.* (17 miles from Perth). Res. Med. Supt., T. Gordon Meikle, M.B., C.M. Crieff station, 1 mile.

Eastbourne.—*Eastbourne Hydropathic.* Eastbourne station, 5 minutes' drive.

Edinburgh.—*Hydropathic*, Slateford.

Forres.—*Cluny Hill Hydropathic.* Vis. Phys., Dr. John Adam. Forres station, 1 mile; Inverness, $2\frac{1}{2}$ miles.

Grange-over-Sands.—*Hazlewood Hydro.* Carnforth, L. & N.W.R., then by Furness Railway; Grange-over-Sands, $\frac{1}{2}$ mile.

Harrogate (Yorkshire).—*Harlow Manor Hydro.* Man., Miss Oakley.

The Harrogate Hydropathic Lim. Phys., Dr. Hinsley Walker. Man., W. Taylor. Harrogate station, $\frac{1}{2}$ mile.

Hexham (Northumberland).—*Tynedale Hydropathic.* Prop., F. G. Grant. Med. Supt., Dr. D. Stewart. Hexham, 1 mile Newcastle, 19 miles.

Ilfracombe.—*The Cliffe Hydro.* Med Supt., C. W. E. Toller, M.D.

Ilkley (Yorkshire).—*Craiglands Hydro.* Res. Phys., Maurice R. Dobson, O.B.E., M.B., B.S. (Lond.), L.R.C.P., M.R.C.S. (Eng.). See also p. 580

The Spa Hydro. Hotel. Ilkley. Man., J. S. Brodie. Vis. Phys., Dr. Henry Veale. Ilkley, 3 minutes.

Limpley Stoke (near Bath).—*West of England Hydropathic.* Apply, the Secretary. Limpley Stoke station.

Malvern.—*The Malvern Hydropathic.* Res. Phys., J. C. Fergusson, M.D. Great Malvern station, $\frac{1}{4}$ mile.

Wyche-side Hydropathic. Malvern. Malvern Wells station, G.W.R., $\frac{1}{2}$ mile Great Malvern station, 2 miles.

Matlock.—*Rockside Hydropathic*, Matlock. Res. Med. Supt., Dr. Marie Goodwin-Orme. Man. Directors, Miss Goodwin and Mr. John G. Goodwin. Matlock, $\frac{1}{2}$ mile.

See also p. 582

Royal Hotel and Baths, Matlock Bath. *Smedley's Hydropathic*, Matlock. Res. and Vis. Physicians. Matlock station, $\frac{1}{2}$ mile; omnibus. See also p. 579

Moffat.—*The Moffat Hydropathic.* Man. Miss Gardner. Med. Supt., Dr. D. Huskie. Moffat station, 1 mile.

Peebles.—*Peebles Hotel Hydropathic.* Res. Phys., Thomas D. Luke, M.D., F.R.C.S. Edin. N.B. and Cal. stations about 10 to 15 minutes' walk.

See also p. 581

Southport (Birkdale Park).—*Smedley Hydropathic.* Phys., J. G. G. Corkhill, M.D. Southport or Birkdale stations.

See also p. 580

Kenworthy's Hydropathic, Southport. Phys., Dr. A. B. Kenworthy. Chapel Street (L. & Y.). Telephone, 80. Tel.: "Kenworthy's, Southport."

See also p. 581

Tunbridge Wells.—*The Spa Hotel.* Station about 1 mile. Apply, Manageress.

Ulverston.—*Conishead Priory Hydropathic.* Visiting Physician, Dr. Robert Ashburner. Ulverston station, $1\frac{1}{2}$ miles.

NURSING INSTITUTIONS AND PRIVATE HOMES FOR INVALIDS.

NURSING INSTITUTIONS AND TRAINING INSTITUTIONS FOR NURSES.

Brighton.—*Brighton Training School of Massage*, 27, Cambridge Road, Hove. Principal, Miss A. M. Poulter.

See also p. 566

Liverpool.—*Male and Female Nurses Institution*, Hope House, Hope Street.

See also p. 585

London.—*Incorporated Society of Trained Masseuses*, 157, Great Portland Street, W. Principal, Miss Templeton.

See also p. 562

London School of Massage, 211, Great Portland Street, W. 1. Principal, Mrs. Hoghton Stewart.

See also p. 566

Male Nurses' Association, 29, York Street, Baker Street, W. 1. Sec., W. J. Hicks.

See also p. 565

New Mental Nurses' Co-operation, 139, Edgware Road, Marble Arch, W.

See also p. 567

Norfolk Square Nursing Association, 49, Norfolk Square, W. 2. Lady Supt., Miss Jean Hastie. Paddington, 7 minutes.

See also p. 564

Swedish Institute and Clinique, 106 and 108, Cromwell Road, S.W. 7. For Medical Gymnastics, Massage and Electricity.

See also p. 564

Temperance Male Nurses' Co-operation, Ltd., 43, New Cavendish Street, W.; also at Manchester, Glasgow, and Dublin. Apply Secretary.

See also p. lxii

The Nurses' Association, 29, York Street, Baker Street, W. 1. Sec., W. J. Hicks Supt., Mrs. Millicent Hicks.

See also p. 565

York.—*The Retreat* (Trained Nurses' Department, for mental and nervous cases only).

See also p. 599

PRIVATE HOMES FOR INVALIDS, MATERNITY HOMES, INSTITUTIONS FOR SPECIAL TREATMENTS, Etc.

Alderley Edge (Cheshire).—*The David Lewis Colony* (for Sane Epileptics), and *Colthurst House School* (for epileptic boys). Res. Director, Alan McDougall, M.D. Alderley Edge, 3 miles. *See also p. 568*

Alresford (Hants).—*Beauworth Manor*. Invalids, any cases except insanity. Speciality: Neurosis. Apply, Res. Superintendent. Alresford, 5 miles; Winchester, 8 miles. *See also p. 570*

Bath.—*Lansdown Grove Hospital and Nursing Home*, Bath (invalids only; special arrangements for patients suffering from gout, rheumatism, and physical infirmities). Physicians, Dr. Percy Wilde and Dr. Wells-Beville. M. or G.W. stations, 1 mile. *See also p. 566*

Bournemouth.—*Branksome Chine House*, Branksome Park, Bournemouth West. For borderland cases. Apply, Dr. Campbell Williams. *See also p. 572*

Broadstairs.—*Bishopsbourne Home for Tuberculosis*. Apply Sec. *See also p. lxiii*

Chorley Wood (Herts).—For neurasthenias, nervous breakdowns, rest cures, and borderland cases. Apply, Dr. Claud Fothergill. *See also p. lxiii*

Edinburgh.—*Queensberry Lodge*, for ladies. Supt., A. Miller. Med. Supt., Dr. William Russell. Waverley station, $\frac{1}{4}$ mile. *See also p. 570*

Hadlow Down, Buxted (Sussex).—*South Beacon* (for the care and treatment of gentlemen mentally affected, but not ill enough to be certified). Prop., Philip H. Harmer. Buxted, 3 miles; Mayfield, 4 miles; Heathfield, 4 miles. *See also p. 570*

Hereford.—*Carlton House*, St. John's Street. Medical, rest-cure, nerve, borderland, and residential home for ladies. Lady Supt., Mrs. Clarke Whitfield.

See also p. 571

Kenley (Surrey).—*Kenley House Nursing Home*, for ladies and gentlemen needing rest and care. Surgical, medical, rest cure. Miss Haslock. *See also p. lxii*

Kreuzlingen, Switzerland.—*Dr. Binswanger Sanatorium, Bellevue*. Nervous and mental complaints. *See also p. 572*

Leatherhead (Surrey).—*Royal School for the Indigent Blind*. Principal, The Rev. St. Clare Hill, M.A. *See also p. lxix*

London.—*Dowsing Medical and Therapeutic Institution*, 39 & 40, York Place, Baker Street, W.1; *The Dowsing Nursing Home*, 3, 4 & 5, Dorset Square, N.W.1.

See also p. 577

Manna Mead Home for Invalids, The Grove, Blackheath, S.E.10. Principals, Mrs. Knight and Miss Tapley-Spurr. Telephone: Greenwich 976.

See also p. 567

Medico-Psychological Clinic, 30, 33 & 34, Brunswick Square, W.C.1. Functional nervous diseases, war shock, and neurasthenia.

See also p. 572

The Radium Institute, 16, Riding House Street, W. Med. Supt., A. E. Hayward Pinch, F.R.C.S.

See also p. 577

St. Thomas's Home, St. Thomas's Hospital, Westminster Bridge, S.E. Apply,

The Steward, St. Thomas's Hospital, S.E. Waterloo, 5 minutes. Tel.: Hop. 1637.

See also p. 573

Muchalls (Kincardineshire). — *Elsick House*, for private and invalid gentlemen. Lessee, J. Niven.

See also p. 576

Peebles, N.B.—*St. Ronan's* (for two or three mild mental cases). Proprietor, Thomas D. Luke, M.D. Peebles, $\frac{1}{4}$ mile.

See also p. 570

Sturry, nr. Canterbury.—*Bishopscourne Home for Tuberculosis*. Apply Secretary.

See also p. lxiii

Tunbridge Wells.—*Mount Ephraim Nursing Home*, 8, Molyneux Park. Medical, surgical, Weir-Mitchell, and massage cases. Excellent facilities for open-air treatment. Apply, Miss Baxter. S.E. & Chatham station, 10 minutes.

See also p. 566

PRINCIPAL BRITISH SPAS,

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

THE BRITISH SPA FEDERATION,

Comprising the Spas of BATH, BUXTON, CHELTENHAM, DROITWICH, HARROGATE, LLANDRINDOD WELLS, WOODHALL, and NEW ZEALAND.

Bath (Somerset).—Sheltered from N. and N.E. winds by hills from 600 to 800 feet high; 2 hours from London. Climate mild and equable. Bath is at its busiest in the autumn, winter and spring months, but has an all-the-year-round season. A winter spa is of priceless value to any country, especially to such a country as Britain where, during the winter months, rheumatism in all its forms is particularly prevalent. During the summer there are some complaints in which Bath proves most efficacious.

Waters.—The only hot springs in Britain (120° F.) and the richest natural radio-active mineral waters in this country.

Therapeutic indications.—Specially suitable for all rheumatic and gouty conditions, skin diseases of gouty and rheumatic origin, chronic laryngitis and pharyngitis, and mucous colitis and similar conditions. A detailed list of complaints successfully treated will be sent on application.

Baths.—An extensive and thoroughly equipped bathing establishment. The Queen's Baths and the Old Royal Baths, the Royal Baths (opened 1916) and the New Wing (opened 1919) provide the latest and most approved balneo-therapeutic methods.

Bath specializes in the treatments for which its waters are particularly adapted: deep baths (500 gallons of natural hot radio-active water), undercurrent douching, douche massage in many forms, and intestinal lavage (Plombières douches), throat sprays and inhalation of the natural radium emanation. Particulars of the many other treatments given will be sent on request by John Hatton, Director of the Spa, Bath.

Nursing and Baths.—Lansdown Grove House (*See p. 566*).

(*See also p. lxvi*).

Buxton (Derbyshire).—1000 to 1200 feet above sea-level. The highest town in the United Kingdom; $3\frac{1}{2}$ hours from London; 1 hour from Manchester. Served by Midland and L. & N.W. Railways. Average rainfall 35 inches. Sunshine 1362 hours. Sheltered from east winds. Very bracing air.

Waters.—Simple, highly radio-active, natural temperature 82° F., mainly bicarbonate of calcium and magnesium ingredients. Tasteless, odourless. Chalybeate springs.

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, sciatica, and various nervous diseases, neurasthenia, disorders of digestion, and skin diseases, malaria, mucomembranous colitis, arteriosclerosis, phlebitis, diseases of the throat and air-passages; anemic conditions, and convalescence from prolonged illness.

Baths.—100 different treatments. All Continental treatments available. Establishments including St. Ann's Well (Pump Room), recently modernized at great cost. Open all the year round. All the latest equipment installed.

Medical Profession, etc.—Complimentary facilities granted to practising medical men and professional nurses.

Boarding Establishment.—The Buckingham (See p. 584).

(See also p. lxvi).

Cheltenham (Gloucestershire).—Protected from N. and N.E. winds by the Cotswold Hills, 184 feet above sea level; 3 hours from London. Climate soft and mild. Average rainfall 30 inches.

Waters.—Of four kinds: the Fieldholme or Twin Salt Saline, containing nearly equal parts of magnesium sulphate and sodium sulphate: sold in bottles by chemists, under the name of "Chelspa," aperient water; the Lansdown or Sodium Sulphate Saline, the chief ingredients of which are sulphate and chloride of sodium, closely resembling Kissingen waters; the Pittville or Alkaline Saline, the only alkaline natural water in Great Britain, very similar in analysis to Carlsbad or Marienbad waters; and the Chadnor or Magnesium and Calcium Saline, containing a large quantity of sulphate of magnesium and a considerable amount of carbonate and sulphate of calcium.

Therapeutic indications.—The Fieldholme water is most useful in gastric hyperacidity, sthenic dyspepsia, obesity, plethora, chronic constipation, hemorrhoidal conditions, and glycosuria associated with obesity; Lansdown water for anæmic dyspeptics, skin affections and chronic gastric catarrh; Pittville water for congestion of the liver, torpid liver, biliary catarrh, gastroduodenal catarrh and gall-stones, also for mucous colitis, toxæmia, glycosuria, and catarrhal conditions of the intestinal tract; and Chadnor water for renal disorders, lumbago, myalgia, torticollis, and other forms of fibrositis.

Baths.—An excellent set of baths and douche and massage apartments at the Montpellier Baths, close to the Central Spa. All the latest baths and treatment.

(See also p. lxvii).

"Chelspa" natural aperient water from the Corporation Wells, sold by chemists. (See p. 499.)

Droitwich (Worcestershire).—150 feet above sea level, 2½ hours from London (Paddington), 19 miles from Birmingham, 6 from Worcester. Rainfall about 23 inches. Mean winter temperature 47° F., summer 69-9° F. The climate is excellent for invalids both in summer and winter. Moderately bracing, but well protected from N. and N.E. winds.

Waters.—The most powerful saline in the world. The brine is pumped from the triassic formation 200 feet below the ground level. Temperature 54° F., and is heated by introducing steam. It is 10 to 12 times as strong as that of the ocean (Channel), containing in every gallon 20,000 grains of saline in excess of other European waters: the waters are radio-active and radio-emanative.

Therapeutic indications.—Chronic muscular and articular rheumatism, rheumatoid arthritis, chronic articular or irregular gout, neuritis, sciatica, neuralgia, heart diseases, especially those of myocardium—effect similar and equal to Nauheim treatment, or the Nauheim treatment, on the most approved principles, is given if prescribed—neurasthenia, anæmia, chlorosis, some sclerotic diseases of spinal cord, dry, scaly skin diseases, e.g., chronic eczema and psoriasis. Moist eczema is contraindicated.

Baths.—Reclining, douche, needle, vapour, swimming, Aix-douche, Nauheim baths,

Hotel.—Worcestershire Brine Baths Hotel. (See p. 583).

brine-pine or Homburg baths, etc.

(See also p. lxvii).

Harrogate (Yorkshire).—600 feet above sea level, 4½ hours from London. Unequaled by any Continental spa, especially for the treatment of gout and its complications. The climate is stimulating and fairly dry—bracing moorland air. Average rainfall 29 inches.

Waters.—Celebrated for the medicinal properties of its 87 springs—sulphurous, chalybeate, alkaline, and saline.

Baths.—There are five establishments, where nearly 100 treatments are given, including all the Continental systems and others. The staff of 200 are all medically trained, and the masseurs, etc., fully certificated. The waters are continually under scientific control by the highly qualified scientific officer on the permanent staff. Harrogate also possesses its own pathologist and bacteriologist, x-ray expert, etc.

The surrounding country is unsurpassed for beauty and interest, and the amusements and recreations are of the highest order.

(See also p. lxviii).

"Aquaperia" aperient mineral water is bottled from a Spring at Harrogate by Camwal Ltd. (See p. 499).

Llandrindod Wells (Radnorshire).—Situated amidst beautiful mountain and river scenery in Mid-Wales at an altitude of 750 feet above sea-level. Climate exceedingly bracing, but sheltered from east winds, and with an average rainfall of about 35 inches. About 5 hours distant from London, on the main L. & N.W. Railway about mid-way between Shrewsbury and Swansea.

Waters.—Celebrated for the variety and efficacy of its numerous medicinal springs. Saline, sulphur and radium-sulphur, magnesium, lithia saline and chalybeate. Slightly aperient and strongly diuretic.

Therapeutic indications.—Digestive disorders, goit and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus or any kidney or bladder condition requiring diuresis, and in neurasthenia or debility from overwork.

Baths.—Sulphur, immersion, needle and douche; Aix and Vichy douche and massage; Scotch douche; Nauheim; medicated baths; Fango and peat baths; whirlpool and agitation baths; almost every known form of electrical treatment by fully qualified staff.

(See also p. lxviii).

Woodhall Spa (Lincolnshire).—50 feet above sea level. 3 hours from London. Average rainfall, 22½ inches. The air, bracing and uncontaminated, sweeping across the Lincolnshire wolds from the sea, is soothing and curative, bringing restful sleep to jaded nerves. The quiet simplicity of Woodhall Spa is in itself a distinction.

Waters.—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

Therapeutic indications.—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases peculiar to women; diseases of throat and dose; liver disorders. Not only is Woodhall Spa the place to visit in cases of rheumatism, gout, or any of the diseases mentioned; but those who are suffering from overwork and nerve-strain will find it a delightful holiday resort.

Spa Baths.—Recently enlarged. Immersion, shower, undercurrent and local douches; Aix and Vichy douche massage; Nauheim, electric and Schnee baths; Dowsing radiant heat and light baths; Bergonié treatment; nose, throat, and eye mineral sprays and douches; Russian and Berthollet vapour; electric, ionic, and x-ray treatments; paraffin-wax treatment; massage and Swedish exercises. There are 60 acres of grounds surrounding the Pump Room and Victoria Hotel. Particulars, apply Secretary.

Hotel.—Victoria Hotel (See p. lxix).

(See also p. lxix).

New Zealand Spas.—The mineral waters of New Zealand are famed both for their great variety and for their powerful therapeutic properties. Many of them are almost unique: quite unlike any European waters; others are of kinds familiar in Europe, but stronger in mineralization than the most famous Continental waters. The principal spas are:—

ROTORUA.—A first-class, well-equipped spa, with complete modern bathing establishment and limitless supply of *Sulphur waters* of two main types: alkaline sulphur, containing sodium chloride, bicarbonate, and silicate; and acid sulphur, containing sulphuric acid, and used for baths only. There are mud baths supplied from the *boiling mud springs*, corresponding to the fango treatment of Italy, and natural vapour baths. The massage and electrical department is thoroughly up to date. The whole establishment is under Government management, and skilled medical attendance is provided. As Rotorua is the centre of the thermal district, numerous minor spas are within easy reach, providing primitive but most excellent baths.

Climate and Season.—The latitude corresponds to that of the south of Spain, but the spa being 1000 ft. up, the climate is by no means hot. Season from October to May, but baths open all the year round.

Accommodation.—Several hotels and numerous boarding houses.

Access by train from Auckland or Wellington.

TE AROHA.—Hot *alkaline waters* of the Vichy type, but double the strength. There are comfortable baths, but this is essentially a place for drinking the waters, which are unique in their strength of sodium bicarbonate.

Climate.—Mild and sedative.

Accommodation.—Several hotels and boarding houses.

Access by train, branch from Rotorua line.

HANMER.—In the South Island: has mild sulphur baths and a bracing climate.

There are numerous smaller resorts only partly-developed, with valuable *iodine saline*, *chalybeate*, *carbonic acid*, and other waters, and a choice of climate from mild subtropical to bracing Alpine.

(See also p. lxix).

OTHER BRITISH SPAS.

Bridge of Allan (Stirlingshire).—422 miles from London. Sheltered from N. and N.E. winds by the Ochil Hills. Average rainfall 33 inches. Climate mild and equable.

Waters.—Natural saline mineral springs (Airthrey).

Therapeutic indications.—Chronic affections of the liver, stomach, and bowels, in many chest diseases, rheumatism, gout, sciatica, and in some diseases of the skin.

Baths.—Excellent suite of baths.

Bridge of Allan mineral water for internal use and as baths (*See p. 498*).

Church Stretton (Salop).—613 feet above sea level. 153 miles from London. Pure bracing air, and a generally invigorating climate. Prevailing wind, S.W. Average rainfall 33 inches.

Waters.—Said to be the purest in Great Britain.

Therapeutic indications.—Specially the 'open-air' cure of neurasthenia, for sequelæ of influenza, for insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from over-work, and convalescence after illness or operation.

Ilkley (Yorkshire).—Situated on the southern slope of the valley of the Wharfe. 18 miles from Harrogate. Occupying a sheltered position. Average rainfall 32 inches. Mean annual temperature, 48° F. Bracing and invigorating moorland air.

Waters.—The water supply obtained from springs is remarkably pure, bright and sparkling. Chalybeate waters. Saline.

Therapeutic indications.—Gout, rheumatism, neuritis, neurasthenia, anæmia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydrotherapeutic.

Baths.—Complete suites of baths are to be found in the numerous establishments. Electrical, Weir-Mitchell.

Hydropathic Establishment.—Craiglands Hydropathic. (*See p. 580*).

Leamington Spa (Warwickshire).—195 feet above sea level; 98 miles from London. Equable and mild climate. Average rainfall 24 inches. Westerly winds prevail.

Waters.—Saline, resembling those of Homburg, but more generally useful.

Therapeutic indications.—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia and neuritis, diseases arising from a plethoric condition of the chylipoietic viscera, eczema and other irritative disorders of the skin, conditions of increased vascular tension, and chronic interstitial nephritis.

Baths.—Turkish, 'whirlpool,' swimming, and electric of all kinds.

(*See also p. lxxv*).

Llangammarch Wells (Breconshire).—600 feet above sea level. 215 miles from London. Well protected from the east, and prevailing wind is S.W. Average rainfall 58 inches.

Water.—Saline, containing the chlorides of barium (6½ grains per gallon), calcium, magnesium, lithium, and sodium; the only one of its kind in the British Isles.

Therapeutic indications.—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves's disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

Hotel.—Lake Hotel. (*See p. 584*.)

(*See also p. 584*).

Malvern (Worcestershire).—520 feet above sea level. 122 miles from London. Air dry and bracing. Prevailing winds S.W. and W. Average rainfall 28 inches.

Waters.—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon.

Therapeutic indications.—Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anæmia, bronchial nephritic, and cutaneous diseases.

Baths.—Natural pure brine (from Droitwich), Turkish and electric baths. Vichy massage and Aix douches, Fango-di-Battaglia.

Hotel.—Goldhill Private Hotel (*See p. 563*).

Matlock Bath (Derbyshire).—300 to 800 feet above sea level, 143 miles from London. Average rainfall 35 inches. Very sheltered.

Waters.—Thermal springs. Mild sulphated alkaline—saline waters at 68° F., containing 33 grains per gallon of salts, mainly magnesium and calcium bicarbonate, and magnesium sulphate.

Therapeutic indications.—Rheumatism, gout, rheumatoid arthritis, neuritis, neurasthenia, catarrhs (bronchial, gastric, or enteric), anæmia, cardiac asthenia, chronic diseases of the liver or kidneys, digestive and biliary disorders.

Baths.—A complete modern installation exists for the administration of all kinds of baths, douches, packs, and other hydropathic treatment, electricity, massage, inhalations, Nauheim baths, with Swedish exercises.

Matlock Bank (*Matlock station*, one mile by rail from Matlock Bath).—South-westerly aspect, and well sheltered from the north. Climate mildly bracing. Sunshine above the average. The Matlock system of hydropathic treatment is carried out in all its branches, and the principal hydros are installed with latest electric baths and appliances, including high-frequency, Dowsing radiant heat and light, Schnee four-cell, x rays, etc. They also include Turkish, Russian, plunge, medicated, and inhalation baths, Aix and Vichy douches.

Hydropathic Establishments.—Rockside Hydropathic (*See p. 582*) ; Smedley's Hydropathic (*See p. 579*).

Peebles (Peebleshire, N.B.).—500 ft. above sea level. One hour from Edinburgh and 382 miles from London. Rainfall, 27 inches. Bracing climate, but sheltered from the north winds.

Waters.—The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well (6 miles east).

Therapeutic indications.—The waters are specially suited to the Nauheim and Bourbon Lancy treatment of cardiac disease, dyspepsia, gout, rheumatism, and neurasthenia.

Baths.—The baths at the hydropathic are of the most modern type. Complete electrical installation and mud baths (Fango-di-Battaglia).

Hydropathic Establishment.—Peebles Hotel Hydropathic (*See p. 581*).

Nursing Home.—St. Ronan's, Peebles. (*See p. 570*).

Ripon (Yorkshire).—120 feet above sea level. $4\frac{1}{4}$ hours from London. Climate mild but bracing. Prevailing winds, W. and S.W.

Waters.—Saline sulphur water from Aldfield Spa, 4 miles distant.

Therapeutic indications.—Chronic and subacute gout, rheumatism, rheumatoid arthritis, chronic skin diseases (eczema, psoriasis, acne), catarrhs, gastric and liver derangements.

The Baths have been lately equipped with up-to-date electric apparatus.

Strathpeffer Spa (Ross-shire, N.B.).—180 to 300 feet above sea level. Sheltered from N. and N.E. winds. Prevailing wind S.W. Bracing air. Average rainfall 31 inches.

Waters.—Sulphurous and chalybeate. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

Therapeutic indications.—Chronic gout and rheumatism, rheumatoid arthritis, chronic skin diseases, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, biliary and urinary calculi, and neurasthenia.

Baths.—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, radiant heat (electric), and high-frequency current.

Trefriw Wells (Carnarvonshire).—5 hours from London. The climate is bracing, the air soft, pure, and mostly of a westerly or south-westerly type.

Waters.—Two varieties: (1) The aluminous chalybeate, and (2) the sulpho-magnesian chalybeate. Used internally, and externally in the form of baths.

Therapeutic indications.—Curable forms of anæmia, nervous, debilitating and wasting diseases, rheumatism, sciatica, gout, and neuritis.

Tunbridge Wells (Kent).—400 feet above sea level, 1 hour from London. Climate is tonic and invigorating. Prevailing winds W. and S.W.

Water.—A weak non-aerated, chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

Therapeutic indications.—Waters indicated in anæmia, chlorosis, and allied conditions.

Baths.—Immersion, douche, needle, Turkish, Russian, vapour, swimming, medicated, and electric light.

Nursing.—Mount Ephraim Nursing Home (*See p. 566*).

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 Ophthalmological Society of the United Kingdom—1, Wimpole Street, W.1.
 Pathological Society of Great Britain and Ireland—University College Hosp., W.C.1.
 Pharmaceutical Society of Great Britain—17, Bloomsbury Square, W.C.1.
 Physiological Society—Sec., University College, Gower Street, W.C.1.
 Poor Law Medical Officers' Association—34, Copthall Avenue, E.C.2.
 Psychical Research Society—20, Hanover Square, W.1.
 Psycho-Medical Society—Sec., Dr. C. A. D. Bryan, 1, Saxe Coburg Street, Leicester.
 Research Defence Society—11, Chandos Street, W.1.
 Röntgen Society—Hon. Sec., R. Knox, M.D., 38, Harley Street, W.1.
 Royal Institute of Public Health—37, Russell Square, W.C.1.
 Royal Medical Benevolent Fund—11, Chandos Street, W.1.

Royal Sanitary Institute, with which is incorporated the Parkes Museum—90, Buckingham Palace Road, S.W.1.
 Royal Society of London—Burlington House, Piccadilly, W.1.
 Royal Society of Medicine—1, Wimpole Street, W.1., incorporated by Royal Charter, 1834 and Supplemental Charter, 1907, and embracing the following Sections:—Anæsthesical—Bæneological and Climatological—Children's Diseases—Clinical—Dermatological—Electro-Therapeutical—Epidemiological and State Medicine—Historical—Laryngological—Medical—Neurological—Obstetrical and Gynæcological—Odontological—Ophthalmological—Otological—Pathological—Psychiatry—Surgical (with sub-sections of Orthopædics and Proctology)—Therapeutical and Pharmacological—War Section.
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 Society for the Relief of Widows and Orphans of Medical Men—11, Chandos Street, W.1.
 Society for the Study of Inebriety—Hon. Sec., 139, Harley Street, W.1.
 Society of Medical Officers of Health—1, Upper Montague Street, W.C.1.
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 State Medical Service Association—Sec., 24, Upper Wimpole Street, W.1.
 Territorial Force Medical Officers' Association—37, Russell Square, W.C.1.
 Tuberculosis Society—Sec., 326, Hoe Street, Walthamstow, E.17.
 United Kingdom Police Surgeons' Association—Hon. Sec., Belle Vue House, Cheltenham
 Wellcome Historical Medical Museum—54a, Wigmore Street, W.1.
 West London Medico-Chirurgical Society—West London Hospital, W.6.

MEDICAL AND SCIENTIFIC PERIODICALS, Etc.

Analyst—Monthly 3/-—Simpkin & Co., 2-8, Orange Street, Leicester Square, W.C.2.
 Anatomy, Journal of—Quarterly, 30/- per annum—Cambridge University Press, Fetter Lane, E.C.4.
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 Bacteriology, Abstracts of—Six times per annum for 23/-—Cambridge University Press, Fetter Lane, E.C.4.
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 Bacteriology, Protozoology and General Parasitology, Review of—Six times per annum for 17/6—36-38, Whitefriars Street, E.C.4. (*See Advertisement.*)
 Brain—Quarterly 4/-—Macmillan & Co. Lim., St. Martin's Street, W.C.2.
 Bristol Medico-Chirurgical Journal—Quarterly 3/-; 10/6 per annum—J. W. Arrow-smith Ltd., Bristol. (*See Advertisement.*)
 British Food Journal and Hygienic Review—Monthly 6d.—32, Shaftesbury Avenue, W.1.
 British Journal of Surgery—Quarterly 12/6 net; 42/- per annum—John Wright & Sons Ltd., Bristol. (*See Advertisement.*)
 British Medical Journal—Weekly 1/-—429, Strand, W.C.2.
 Burdett's Hospitals and Charities—Yearly 12/6—28-29, Southampton Street, W.C.2.
 Caledonian Medical Journal—Quarterly 1/-—70, Mitchell Street, Glasgow.
 Cancer Research, Journal of—Quarterly, 23/- per annum—Cambridge University Press, Fetter Lane, E.C.4.
 Charing Cross Hospital Gazette—Quarterly, 2/6 per annum—Charing Cross Hospital, Chandos Street, W.C.2.
 Child, The—Monthly 2/-—Bale, 83-91, Great Titchfield Street, W.1.
 Child Welfare Annual—Yearly 7/6—83-91, Great Titchfield Street, W.1.
 Children's Diseases, British Journal of—Quarterly 6/-; 20/- per annum—Adlard & Son and West Newman, Bartholomew Close, E.C.1.
 Clinical Journal—Monthly, 20/- per annum—23, Bartholomew Close, E.C.1.
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 Dental Record—Monthly, 7/6 per annum—Alston House, Newman Street, W.1.
 Dental Science, British Journal of—Monthly 6d.; 7/6 per annum—Bale, 83-91, Great Titchfield Street, W.1.
 Dental Surgeon—Weekly 3d.; 13/- per annum—Baillière, 8, Henrietta Street, W.C.2.
 Dentists' Register—Yearly 3/4—Constable, 10, Orange Street, W.C.2.
 Dermatology, British Journal of—Quarterly, 25/- per annum—H. K. Lewis & Co. Lim., 136, Gower Street, W.C.1.
 Dublin Journal of Medical Science—20/- per annum—41, Grafton Street, Dublin.
 Edinburgh Medical Journal—Monthly, 30/- per annum—Oliver & Boyd, Tweeddale Court, Edinburgh.

- Glasgow Medical Journal—Monthly 2/- —70, Mitchell Street, Glasgow.
- Guy's Hospital Gazette—Fortnightly 6d.; 7/6 per annum—Ash & Co. Lim., Henry Street, Bermondsey, S.E.1.
- Guy's Hospital Reports—Yearly 10/6—7, Great Marlborough Street, W.1.
- Heart: A Journal for the Study of the Circulation—Quarterly, 20/- per annum—Shaw & Sons, 7, Fetter Lane, E.C.4
- Homeopathic Journal, British—Monthly 1/- —Bale, 83-91, Gt. Titchfield Street, W.1.
- Homeopathic World—Monthly 6d.—12, Warwick Lane, E.C.4.
- Hospital—Weekly 2d.; 10/10 per annum—28, 29, Southampton Street, W.C.2. (*See Advertisement.*)
- Hygiene, Journal of—Quarterly, 10/6—Cambridge University Press, Fetter Lane, E.C.4.
- Immunology, Journal of—Six times per annum 23/- —Cambridge University Press, Fetter Lane, E.C.4.
- Indian Medical Gazette—Monthly, 21/- per annum—Thacker & Co., 2, Creed Lane, E.C.4. (*See Advertisement.*)
- Inebriety, British Journal of—Quarterly 1/- —Baillière, 8, Henrietta Street, W.C.2.
- Lancet—Weekly 10d.; 36/- per annum—423, Strand, W.C.2. (*See Advertisement.*)
- Laryngology, Rhinology, and Otology, Journal of—Monthly, 40/- per annum—Adlard & Son, 23, Bartholomew Close, E.C.1. (*See Advertisement.*)
- Laryngoscope, The—Monthly, 35/- per annum—Baillière, 8, Henrietta Street, W.C.2.
- London Hospital Gazette—Monthly 1/-; 10/- per annum—5, Rupert Street, E.1.
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- Medical Annual—Yearly 15/- net to subscribers; 20/- after publication—John Wright & Sons Lim., Bristol.
- Medical Directory—Yearly 24/-—Churchill, 7, Great Marlborough Street, W.1.
- Medical Magazine—Monthly 1/-; 10/6 per annum—44, Bedford Row, W.C.1.
- Medical Officer—Weekly 6d.; 25/- per annum—36-38, Whitefriars Street, E.C.4. (*See Advertisement.*)
- Medical Press and Circular—Weekly 6d.; 21/- per annum—Baillière, 8, Henrietta Street, W.C.2. (*See Advertisement.*)
- Medical Register—Yearly 10/6—Constable, 10, Orange Street, W.C.2.
- Medical Review—Monthly 2/6—70, Finsbury Pavement, E.C.2.
- Medical Science Abstracts and Reviews—Monthly, 21/- per annum—Oxford University Press, Amen Corner, E.C.4.
- Medical Temperance Review—Quarterly 6d.—Adlard & Son and West Newman, 23, Bartholomew Close, E.C.1.
- Medical Times—Weekly 4d.; 14/- per annum—49 & 50, Watling Street, E.C.4
- Medical World—Weekly 6d.—14, Gray's Inn Square, W.C.1.
- Medical and Dental Students' Register—Yearly 2/6—10, Orange Street, W.C.2.
- Mental Science, Journal of—Quarterly 5/-—7, Great Marlborough Street, W.1.
- Microscopical Science, Quarterly Journal of—12/6—J. & A. Churchill, 7, Great Marlborough Street, W.1.
- Middlesex Hospital Journal—3/6 per annum—140, Wardour Street, W.1.
- Midland Medical Journal—Monthly 4d.—Briars Hey, Stechford, Birmingham.
- Midwives' Roll—Yearly 21/- —Spottiswoode, 1, New Street Square, E.C.4.
- National Medical Journal—Monthly 4d.—346, Strand, W.C.2.
- Neurology and Psychiatry, Review of—30/- per annum—15, Frederick Street, Edinburgh.
- Neurology and Psychopathology, Journal of—Quarterly, 8/6 net; 30/- per annum—John Wright & Sons Lim., Bristol. (*See Advertisement.*)
- Obstetrics and Gynaecology of the British Empire, Journal of—Monthly 2/6—34, Cross Street, Manchester.
- Open-Air Schools and Children's Sanatoria, Year Book of—Yearly 7/6—Bale, 83-91, Great Titchfield Street, W.1.
- Ophthalmological Society's Transactions—Yearly 12/6—J. & A. Churchill, 7, Great Marlborough Street, W.1.
- Ophthalmology, British Journal of—Monthly, 42/- per annum—Pulman & Sons Lim., 24, Thayer Street, W.1.
- Parasitology—Quarterly 12/6—Cambridge University Press, Fetter Lane, E.C.4.
- Pathology and Bacteriology, Journal of—Quarterly, 21/- per annum—Pathological Laboratory, Museums, Cambridge.
- Pharmacology and Experimental Therapeutics, Journal of—Six times per annum for 28/- —Cambridge University Press, Fetter Lane, E.C.4.
- Pharmacy, Year Book of—Yearly 12/6—7, Great Marlborough Street, W.1.
- Physiological Abstracts—Monthly, 30/- per annum—136, Gower Street, W.C.1.
- Physiology (Experimental), Quarterly Journal of—30/- per annum—Chas. Griffin & Co. Lim., Exeter Street, W.C.2.
- Physiology, Journal of—Quarterly, 25/- per volume—Fetter Lane, E.C.4.
- Practitioner—Monthly 4/-; 42/- per annum—2, Howard Street, Strand, W.C.2.

- Prescriber—Monthly, 20/- per annum—6, South Charlotte Street, Edinburgh.
- Psychobiology—Six times per annum for 23/- —Cambridge University Press Fetter Lane, E.C.4.
- Psychology, British Journal of—Quarterly, 21/- —Cambridge University Press, Fetter Lane, E.C.4.
- Public Health—Monthly 1/8; 21/- per annum—1, Upper Montague Street, W.C.1.
- Quarterly Journal of Medicine—Quarterly 8/6 net—Oxford University Press, Amen Corner, E.C.4.
- R.A.M.C., Journal of the—Monthly 2/- —Bale, 83-91, Great Titchfield Street, W.1.
- Radiology and Electrotherapy, Archives of—Monthly 3/- —W. Heinemann Ltd., 20 Bedford Street, W.C.2.
- Röntgen Society, Journal of the—Quarterly 4/- —Smith & Ebbs Lim., Northumberland Alley, Fenchurch Street, E.C.3.
- Royal Dental Hospital Reports—Quarterly, 5/- per annum—Bale, 83-91, Great Titchfield Street, W.1.
- Royal Naval Medical Service, Journal of the—Quarterly, 20/- per annum—83-91, Great Titchfield Street, W.1.
- Royal Sanitary Institute, Journal of the—Quarterly 3/- —12, Long Acre, W.C.2.
- School Hygiene—Quarterly, 4/6 per annum—Adlard, 23, Bartholomew Close, E.C.1.
- South African Medical Record—Fortnightly 1/-; 21/- per annum—Bailliére, 8, Henrietta Street, W.C.2.
- St. Bartholomew's Hospital Journal—Monthly 6d.—Students' Union, St. Bartholomew's Hospital, E.C.2.
- St. George's Hospital Gazette—Monthly 6d.—83-91, Great Titchfield Street, W.1.
- St. Mary's Hospital Gazette—Monthly, 5/- per annum—187, Edgware Road, W.2.
- St. Thomas's Hospital Gazette, Monthly, 5/- per annum—St. Thomas's Hospital, S.E.1.
- St. Thomas's Hospital Reports—Yearly 8/6—7, Great Marlborough Street, W.1.
- State Medicine, Journal of—Monthly, 2/- —Bale, 83-91, Gt. Titchfield Street, W.1.
- Surgery, British Journal of—Quarterly, 12/6 net; 42/- per annum—John Wright & Sons Lim., Bristol. (*See Advertisement.*)
- Surgery, Gynaecology, and Obstetrics, and International Abstract of Surgery—Monthly 5/-; 50/- per annum—Bailliére, 8, Henrietta Street, W.C.2.
- Tropical Diseases Bulletin—Fortnightly 2/- —Bailliére, 8, Henrietta Street, W.C.2.
- Tropical Medicine and Hygiene, Journal of—Fortnightly 1/-; 21/- per annum—Bale, 83-91, Great Titchfield Street, W.1.
- Tropical Medicine and Hygiene, Year Book of—Yearly 7/6—Bale, 83-91, Great Titchfield Street, W.1.
- Tropical Medicine and Parasitology, Annals of—Quarterly, 22/6 per annum—University Press, 57, Ashton Street, Liverpool.
- Tubercle—Monthly 2/6—Bale, 83-91, Great Titchfield Street, W.1.
- Tuberculosis, British Journal of—Quarterly 1/6—Bailliére, 8, Henrietta Street, W.C.2. (*See Advertisement.*)
- Tuberculosis Year Book and Sanatoria Annual—Yearly 10/6—Bale, 83-91, Great Titchfield Street, W.1.
- Universal Medical Record—Monthly, 25/- per annum—36-38, Whitefriars Street, E.C.4.
- Urology, Journal of—Six times per annum for 23/- —Cambridge University Press, Fetter Lane, E.C.4.
- West London Medical Journal—Quarterly 1/- —23, Bartholomew Close, E.C.1.

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 Oxford University Press (Humphrey Milford), Amen Corner, E.C.4
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University of London Press Lim., Warwick Square, E.C.4
 Wright, John & Sons Lim., Bristol (and Printers); London Depot, Stationers' Hall Court, E.C.4

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Hearson, Chas. & Co. Lim., 235, Regent Street, W.1 (Incubators)
 Holborn Surgical Instrument Co. Lim., 26, Thavies Inn, E.C.1
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 Lewis, Henry, 2, Westmoreland Street, New Cavendish Street, W.1
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 Millikin & Lawley, 165, Strand, W.C.2
 Montague, J. H., 69, New Bond Street, W.1
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 Weiss, John & Son Lim., 287, Oxford Street, W.1
 Woolley, Jas. Sons & Co. Lim., Victoria Bridge, Manchester

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1920

JANUARY.	
S	• 411 18 25
M	• 512 19 26
Tu	• 613 20 27
W	• 714 21 28
Th	1 815 22 29
F	2 916 23 30
S	3 1017 24 31

NOTES.

Copy here any formula or fact you wish
to keep for reference.

1920

FEBRUARY.	
S	1 815 22 29
M	2 916 23 30
Tu	3 1017 24 *
W	4 1118 25 *
Th	5 1219 26 *
F	6 1320 27 *
S	7 1421 28 *

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See Advertisement, page xli.

Signed.....M.D.

1920

MARCH.	
S	* 71421 28
M	1 815 22 29
Tu	2 916 23 30
W	3 1017 24 31
Th	4 1118 25 *
F	5 1219 26 *
S	6 1320 27 *

NOTES.

1920

APRIL	
S	* 411 18 25
M	* 512 19 26
Tu	* 613 20 27
W	* 714 21 28
Th	1 815 22 29
F	2 916 23 30
S	3 1017 24 *

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1920

MAY.	
S	9 91638 80
M	3101734 81
Tu	4111825 *
W	5121926 *
Th	6132027 *
F	7143128 *
S	8153229 *

NOTES.

1920

JUNE.	
S	* 6182027
M	* 7143128
Tu	1 8153229
W	2 9163330
Th	3101734 *
F	4111825 *
S	5121926 *

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See Advertisement, page xxxv.

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1920

JULY.	
S	* 4111825
M	* 5121926
Tu	* 6132027
W	* 7142128
Th	1 8152229
F	2 9162330
S	3 10172431

NOTES.

1920

AUGUST.	
S	1 8152229
M	2 9162330
Tu	3 10172431
W	4 111825 *
Th	5 121926 *
F	6 132027 *
S	7 142128 *

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(20 YEARS OLD.)

See Advertisement, page xcvi.

1920

SEPTEMBER.	
S	* 5121926
M	* 6182027
Tu	* 7142128
W	1 8152229
Th	2 9162330
F	3101734 *
S	4111835 *

NURSES.

Note whether Midwifery or Sick Nurses,
their terms and addresses.

1920

OCTOBER.	
S	* 310172481
M	* 4111825 *
Tu	* 5121926 *
W	* 6182027 *
Th	* 7142128 *
F	1 8152229 *
S	2 9162330 *

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1920

NOVEMBER.	
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M	1 816:11 29
Tu	2 916:21 10
W	31017 34 *
Th	41118 35 *
F	51319 36 *
S	61820 27 *

ADDRESSES (PRIVATE).

1920

DECEMBER.	
S	* 31219 26 *
M	* 61820 27 *
Tu	* 71421 28 *
W	1 815 22 29 *
Th	2 916 23 30 *
F	31017 24 31 *
S	41118 25 *

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See Advertisement, page xxix.

1921

JANUARY.	
S	* 2 9162380
M	* 810172481
Tu	* 4111823 *
W	* 5121922 *
Th	* 6132027 *
F	* 7142128 *
S	1 8152229 *

NOTES.

1921

FEBRUARY.	
S	* 6132027
M	* 7142128
Tu	1 81522 *
W	2 91623 *
Th	3101724 *
F	4111825 *
S	5121926 *

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The Chief Ingredients are Salts of Calcium, Sodium, and Magnesium. The water is clear, odourless, and has a not unpleasant Saline taste.

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The Remedy of Royalty for 100 years.

RESULTS OF ANALYSIS by Dr. THRESH, 29th Jan., 1915.



	Per 100,000	Gr. per gall.	Gr. per pint
Calcium Carbonate -	41.2	28.84	3.6
Calcium Sulphate -	109.8	76.86	9.6
Magnesium Sulphate -	2000.7	1400.49	175.1
Sodium Sulphate -	1918.8	1343.16	167.9
Sodium Chloride -	490.0	343.00	42.9
Potassium Chloride -	89.2	63.44	7.8
Nitrates, Silica	7.9	5.53	.7
Iron, Alumina, and Lithium	traces	traces	traces
Totals -	4657.6	3260.32	407.6

Equivalent of Crystalline Salt per pint : 359 grs. Magnes. Sulph. and 381 gr. Sodium Sulph.

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- (3) The Indemnity is guaranteed independently of the Medical Defence Union by the above old-established Company, possessing accumulated funds of over *six millions sterling*.

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THIRD PARTY. PLATE GLASS. LIVE STOCK, Etc.**

INDEX TO LIFE ASSURANCE OFFICES.

A, when Established ; B, C, D, Annual Premiums to Insure £100 on death, with Profits, at the age of 30, 40, and 50 ; E, Assurance and Annuity Funds, exclusive of Paid-up Capital ; M, Mutual Offices ; P, Proprietary Offices.

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TITLE, ETC., OF OFFICE.	A	B	C	D	E
Abstainers and General Insurance Co., Ltd., Edmund St., Birmingham. <i>Gen. Manager</i> , H. J. Greening	1883	40/11	55/10	82/3	£ 1,137,155
Alliance Assurance Co. Ltd., Bartholomew Lane, E.C. <i>Gen. Man.</i> , O. Morgan Owen	1824	48/9	64/5	90/9	17,715,387
Atlas Assurance Co. Ltd., 92, Cheapside, E.C. <i>Gen. Man.</i> , C. E. Falloon. <i>Act.</i> , William Penman	1808	49/3	63/7	88/8	2,598,974
Australian Mutual Provident Society, Life, Endowments and Annuities, 37, Threendneedle Street, E.C. <i>Manager</i> for U.K., W. C. Fisher. Further particulars see page 509	1849	48/2	64/5	89/10	39,190,281
Britannic Assurance Co. Ltd., Life, En- dowment Assurances, House Purchase, Broad Street Corner, Birmingham. <i>Chair-</i> <i>man</i> , F. T. Jefferson, J.P. <i>Secretary</i> , J. M. Laing, F.I.A. Further particulars see page 508	1866	47/9	64/-	91/1	4,806,841
British Equitable Assurance Co. Ltd., 1, 2, 3, Queen Street Place, E.C. <i>Manager</i> , Basil May, F.I.A.	1854	48/8	64/11	91/9	1,502,149
Caledonian Insurance Co., 19, George Street, Edinburgh. <i>Gen. Man.</i> , R. Hill Stewart, F.F.A. London Offices, 82, King William St., E.C., and 14, Waterloo Place, S.W. P	1805	48/9	64/6	88/6	3,671,316
Canada Life Assurance Co., 15, King Street, Cheapside, E.C. <i>Man.</i> , J. R. Wandless, F.I.A.	1847	48/5	65/4	94/2	13,167,970
Century Insurance Co. Ltd., 18, Charlotte Sq., Edinburgh. <i>Man. Dir.</i> , Hy. Brown. <i>Sec.</i> , John R. Little. London Office, 27, Queen Victoria St., F.C.4. <i>Man.</i> , S. G. Pasfield	1885	50/-	65/4	91/-	1,163,020
City Life Assurance Co. Ltd., 6, Paul Street, Finsbury, E.C. <i>Gen. Man.</i> , D. Bailey, F.S.S.	1897	44/1	60/11	89/7	1,066,021
Clerical, Medical and General Life Assurance Society, 15, St. James's Square, S.W., and 1, King William Street, E.C. <i>Gen. Man. &</i> <i>Act.</i> , A. D. Besant	1824	48/7	66/6	95/6	6,312,720
Colonial Mutual Life Assurance Society Ltd., 33, Poultry, E.C. <i>Man.</i> , Arthur E. Gibbs. <i>Assist. Man.</i> , Ernest A. Cawdron	1873	48/9	65/1	89/10	5,000,000
Commercial Union Assurance Co. Ltd., 24, 25, and 26, Cornhill, E.C. <i>Act.</i> , A. G. Allen	1861	47/10	65/2	92/4	7,632,746
Co-operative Insurance Society Ltd., 109, Corporation Street, Manchester. <i>Man.</i> , J. P. Jones. Further particulars see page 510	1867	47/4	63/1	90/1	950,000
Eagle Star & British Dominions Insurance Co., Ltd. Head Office, British Dominion House, Royal Exchange Avenue, E.C. 3 ; Life Dept., 32, Moorgate St. E.C. 2. <i>Man.</i> <i>Dir.</i> , Sir Edward M. Mountain	1807	47/9	63/6	89/8	12,582,679
Edinburgh Assurance Co., Ltd., 26, George Street, Edinburgh. <i>Man.</i> , T. M. Gardiner. <i>Act.</i> , A. E. Sprague, D.Sc., P.F.A., F.I.A. <i>Secs.</i> , A. E. Sprague and Arthur Gorges, London, 3, Birchin Lane, E.C. <i>Sec.</i> , J. J. Bisgood	1823	47/10	65/2	92/4	4,228,216
Equitable Life Assurance Society, Mansion House Street, E.C.2. <i>Act. & Man.</i> , W. Palin Elderton, F.I.A.	1762	53/5	67/11	90/7	4,861,569

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†The Legal and General Assurance are not for the present issuing Policies under with Profit tables.

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Equity and Law Life Assurance Society, 18, Lincoln's Inn Fields, W.C. <i>Man. & Sec.</i> , W. P. Phelps, M.A., F.I.A. ... P	1844	48/10	64/6	90/9	5,129,046
Friends' Provident Institution, 42, Kingsway, W.C.2. <i>Gen. Man.</i> , Henry J. Tapscott. <i>Act.</i> , Alfd. Moorhouse, F.I.A. ... M	1832	48/-	64/-	89/7	3,337,985
General Accident Fire and Life Assurance Corporation Ltd., Perth, Scotland. <i>Gen. Man.</i> , F. Norie-Miller, J.P. ... P	1885	49/2	64/11	91/3	259,820
General Life Assurance Co., 103, Cannon Street, E.C.4. <i>Sec.</i> , Albert Burton Nye. Further particulars see page 506 P	1837	49/10	65/4	92/8	1,932,366
Gresham Life Assurance Society Ltd., St. Mildred's House, Poultry, E.C.2. <i>Gen. Man. & Sec.</i> , Alexander Lawson ... P	1848	47/6	62/10	88/6	9,603,603
Guardian Assurance Co. Ltd., 11, Lombard Street, and 21, Fleet St., E.C. <i>Gen. Man.</i> , Geo. W. Reynolds. <i>Act.</i> , Ernest Woods P	1821	48/10	64/6	89/3	4,596,097
Law Union and Rock Insurance Co. Ltd., Old Serjeants Inn, Chancery Lane. <i>Gen. Man.</i> , R. Stirling. ... P	1806	48/4	64/-	89/10	8,650,125
†Legal & General Assurance Society, 10, Fleet St., E.C. <i>Act. & Man.</i> , E. Colquhoun P	1836	36/-	50/-	74/4	12,194,065
Life Association of Scotland, 82, Princes St., Edinburgh. <i>Man.</i> , Gordon Douglas. <i>Sec.</i> , R. M. M. Roddick. London Office, 28, Bishopsgate, E.C.2. <i>Sec.</i> , G. S. N. Carter, F.I.A.	1838	48/11	64/10	91/1	5,764,922
Liverpool and London and Globe Insurance Co. Ltd., 1, Dale Street, Liverpool. <i>Gen. Man. & Sec.</i> , A. G. Dent. London Office, 1, Cornhill, E.C. ... P	1836	49/10	65/9	91/3	4,900,471
London and Scottish Assurance Corporation Ltd., 66, 67, Cornhill, E.C. <i>Gen. Man.</i> , W. Eneas Mackay. <i>Sec.</i> , Louis I. Jarvis. <i>Jud. Asst. Sec.</i> , E. E. Dent and L. C. Kestin. <i>Act.</i> , Harold Dougherty ... P	1862	48/9	64/9	91/2	4,102,636
London Assurance Corporation, 7, Royal Exchange, E.C. <i>Man. of Life Dept.</i> , James Clunes. <i>Act.</i> , A. G. Hemmung ... P	1720	49/-	64/8	90/2	2,897,684
London Life Association, Ltd., 81, King William Street, E.C. <i>Act. & Man.</i> , H. M. Trouncer, M.A., F.I.A. ... M	1806	47/-	61/8	85/4	5,703,172
Marine and General Mutual Life Assurance Society, 14, Leadenhall Street, E.C. <i>Act. & Sec.</i> , S. Day, F.I.A. ... M	1852	48/10	65/-	91/6	*2,181,090
Metropolitan Life Assurance Society, 13, Moorgate Street, E.C.2. <i>Act. & Man.</i> , H. J. Baker, F.I.A. ... M	1835	49/9	66/4	92/-	2,321,231
Mutual Life and Citizens' Assurance Co. Ltd. (of Australia), Effingham Ho., 1, Arundel St. W.C. <i>Sec.</i> , Alex. S. Sellar, M.A., F.F.A. P	1886	48/9	65/3	89/9	11,031,499
Mutual Life Insurance Co. of New York, 7 & 8, Norfolk Street, Strand, W.C.2. <i>Gen. Man.</i> , J. H. Harrison Hogge. <i>Sec.</i> , L. A. Mumford M	1843	48/9	66/-	97/-	130,035,435
National Benefit Assurance Co. Ltd., National House, Newgate Street, E.C. <i>Man.</i> , J. Francis, O.B.E., J.P., F.S.S. <i>Sec.</i> , S. F. Gandell. Further particulars see page 508 ... P	1890	46/4	61/7	87/4	46,135
National Mutual Life Assurance Society, 39, King Street, Cheapside, E.C. <i>Act. & Man.</i> , G. Marks, O.B.E., F.I.A. <i>Asst. Act.</i> , Capt. H. G. Sharp, F.I.A. <i>Ag. Man.</i> , G. V. S. Booth. M	1830	48/4	63/7	89/6	3,080,785
National Mutual Life Association of Australasia, Ltd., 5, Cheapside, E.C. <i>Man.</i> , H. W. Meyers. ... M	1869	46/8	61/6	87/2	*10,800,000
National Provident Institution, 48, Gracechurch Street, E.C. <i>Act. & Sec.</i> , L. F. Hovill ... M	1835	50/2	66/3	91/1	7,241,407

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New York Life Insurance Co., Trafalgar Buildings, Trafalgar Square, London, W.C. <i>Gen. Man., E. H. Krause. Sec., Wm. R. Collinson, F.C.I.S.</i> .. M	1845	48/9	66/-	96/11	204,476,992
North British and Mercantile Insurance Co., 61, Threadneedle St., E.C. 2, & 64, Princes St., Edinburgh. <i>Gen. Man., London, A. Worley. Life Man., London, D. C. Halderman. Gen. Man., Edin., Owen D. Jones</i> P	1809	49/10	66/1	91/11	17,920,701
Northern Assurance Co. Ltd., 1, Moorgate Street, E.C. <i>Joint Gen. Managers, H. Gayford, J. Robertson</i> .. P	1836	49/-	64/8	90/10	5,061,273
Norwich Union Life Insurance Society, Norwich. <i>Gen. Man. & Act., Davidson Walker. London Office, 49, Fleet Street, E.C.4.</i> ..	1808	45/8	59/6	85/3	16,190,199
Pearl Assurance Co. Ltd., 252, High Holborn, W.C.1. <i>Man'g Director, G. Shrubbsall, J.P. P</i>	1864	49/-	65/-	92/-	13,160,160
Phoenix Assurance Co. Ltd., Phoenix House, King William St., E.C. 4, Trafalgar House, Waterloo Place, S.W. 1, & 187, Fleet Street, E.C. 4. <i>Gen. Man., Sir Gerald H. Ryan, F.I.A.</i> .. P	1782	48/11	64/7	90/8	11,605,173
Provident Mutual Life Assurance Association, 27 & 29, Moorgate Street, E.C. <i>Man. & Act., C. R. V. Coutts</i> .. M	1840	48/8	64/8	90/4	2,890,112
Prudential Assurance Co. Ltd., Holborn Bars. <i>Sec., Sir George May, K.B.E. Further particulars see page 509</i> P	1848	49/6	65/11	91/11	52,436,504
Refuge Assurance Co. Ltd., Oxford Street, Manchester. <i>Gen. Man., J. Procter Green and W. H. Aldcroft. London Office, 133, Strand, W.C.</i> .. P	1864	49/3	65/9	91/9	15,681,076
Royal Exchange Assurance Corporation, Royal Exchange, E.C., and 44, Pall Mall, S.W. <i>Act., H. E. Nightingale, F.I.A.</i> P	1720	49/-	64/9	90/2	4,832,391
Royal Insurance Co. Ltd., 1, North John St., Liverpool. <i>Gen. Man., G. Chappell. London Offices, 24-28, Lombard Street. Sec. to London Board, R. M'Connell</i> .. P	1845	48/8	64/4	90/4	12,533,165
Scottish Amicable Life Assurance Society, St. Vincent Place, Glasgow. <i>Gen. Man., W. Hutton. Sec., C. Guthrie. London Office, 1, Threadneedle St., E.C. Sec. H. Robertson</i> .. M	1826	51/9	66/3	90/1	6,549,925
Scottish Equitable Life Assurance Society, 28, St. Andrew Square, Edinburgh. <i>Man. & Act., G. M. Low. Sec., J. M. Warden. London Office, 13, Cornhill, E.C. 3. Sec., P. W. Purves</i> .. M	1831	50/-	65/5	90/6	6,017,007
Scottish Life Assurance Co. Ltd., 19, St. Andrew Square, Edinburgh. <i>Man., Lewis P. Orr, F.R.S.E. London Office, 9 & 10, King St., E.C. Sec., I. Campbell</i> P	1881	49/5	64/6	90/5	2,671,228
Scottish Provident Institution, 6, St. Andrew Square, Edinburgh. <i>Man., J. G. Watson. Sec., R. T. Boothby. Joint Asst. Secs., C. W. Thomson & A. Graham Donald. Act., W. G. Walton. London Offices, 3, Lombard St. E.C., and 17, Pall Mall, S.W.</i> .. M	1837	42/4	56/6	83/2	16,000,000
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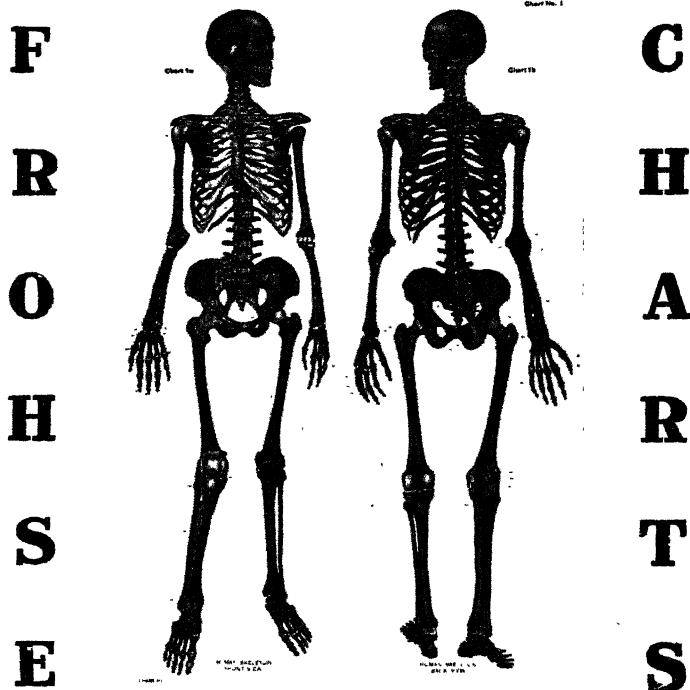
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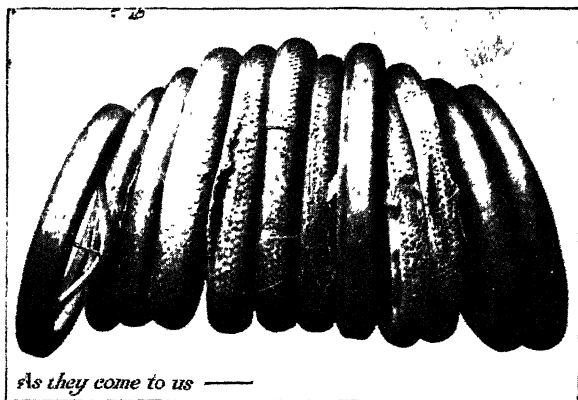
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Signed, **GEORGE E. WAUGH, F.R.C.S.**, Dean to the Medical School.

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CLINICAL WORK is done at the Bristol Royal Infirmary, and the Bristol General Hospital, which together contain over 550 beds. The Bristol Royal Hospital for Sick Children and Women, the Bristol Eye Hospital, the Bristol City and County Asylum, and the Bristol City Fever Hospital are also open for the clinical instruction of students.

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All information is given in the Calendar of the University of Durham College of Medicine, Newcastle-upon-Tyne, which may be obtained gratis from the Secretary at the College.

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- (a) A Composition Ticket for Lectures at the College may be obtained—
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3. Clerks and Dressers are appointed by the Physicians and Surgeons. These appointments are open to all Students and Junior Practitioners holding Hospital Tickets.
4. Assistants in the Pathological Department are appointed by the Pathologist.

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Hospitals.—The Clinical School consists of four general hospitals—the Royal Infirmary, the David Lewis Northern Hospital, the Royal Southern Hospital, and the Stanley Hospital; and of five special hospitals; the Eye and Ear Infirmary, the Hospital for Women, the Infirmary for Children, St. Paul's Eye Hospital, and St. George's Hospital for Skin Diseases. These hospitals contain in all a total of 1134 beds.

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Instruction is also given in special departments of Medical Practice by Lecturers appointed by the University Court.

Clinical instruction is obtained in the Royal Infirmary, Royal Lunatic Asylum, the Sick Children's Hospital, the City (Fever) Hospital, the General Dispensary, Maternity Hospital and Vaccine Institutions, and the Ophthalmic Institutions.

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The cost of Matriculation, Class and Hospital Fees for the whole curriculum, inclusive of the fees for the Degrees, is usually about £160.

A Prospectus of the Classes, Fees, &c., may be had on application to the Secretary of the Faculty of Medicine.

THEODORE SHENNAN, M.D., F.R.C.S.E., *Dean of Medical Faculty.*

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FOUNDED 1505.

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Two, of £50 each, in Anatomy and Physiology	in September.

The April Scholarships are open to students entering for the Summer session, and the others to those prepared to enter in October. Those in Anatomy and Physiology are open to students of any University in the United Kingdom or British Dominions. Women Students are admitted.

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and SANATORIUM at FRIMLEY.

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ROYAL DENTAL HOSPITAL OF LONDON.

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MR. G. W. DAWSON	Thurs. 2 p.m.	Tues. 10 a.m.
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THE OBJECTS OF THE UNION ARE AS FOLLOWS:

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1894.

INCORPORATED
1906.

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For further information apply to the Organizing Secretary:—

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(FOUNDED 1892.)

LIMITED.

Registered Offices: 32 Craven Street, Strand, W.C.2

Telegrams:

"MEDICAVERO WESTRAND, LONDON."

Telephone:

CENTRAL 5098.

President:

SIR JOHN ROSE BRADFORD, K.C.M.G., C.B., M.D., F.R.C.P., F.R.S.

Trustees for the Reserve Fund:

SIR R. DOUGLAS POWELL, BART., K.C.V.O., M.D., F.R.C.P.

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PRINCIPAL OBJECTS.

To protect, support, and safeguard the character and interests of legally qualified Medical and Dental Practitioners; to advise and assist Members of the Society in matters affecting their professional character and interests; and to indemnify them in regard to actions, etc., undertaken on their behalf.

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Members of the London and Counties Medical Protection Society are not only indemnified against the cost of defending or conducting actions undertaken on their behalf by the Society, whether as plaintiffs or defendants, but are also, subject to the provisions of the Articles of Association, indemnified, up to £2,000 in any one year for any one Member, against the damages and costs of the other side which may be awarded against them in cases which the Society has defended or conducted on their behalf, but in which it has not been successful.

Provision has been made for the latter purpose of an available sum of £24,000 per annum.

IMPORTANT NOTICE.

The Society is subject to no control by its Underwriters or by any other outside body in the conduct of its business or in the matter of appeal. The management of the cases referred to the Society rests entirely with the Council.

Entrance Fee, 10/-. Subscription, £1 per annum.

On the 29th June, 1919, the Invested Funds of the Society, taken at their market value as on the 1st January, 1919, amounted to £24,200, of which the sum of £15,285 was invested in War Stock and National War Bonds.

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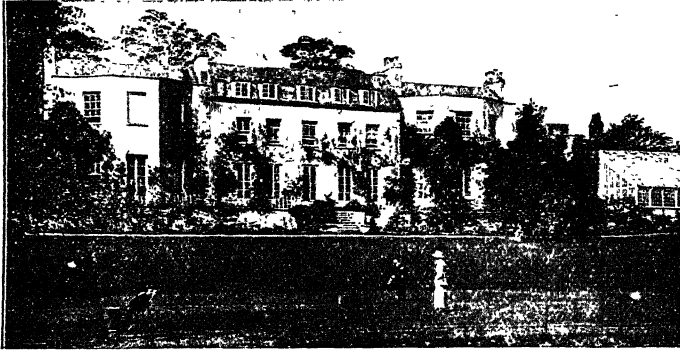
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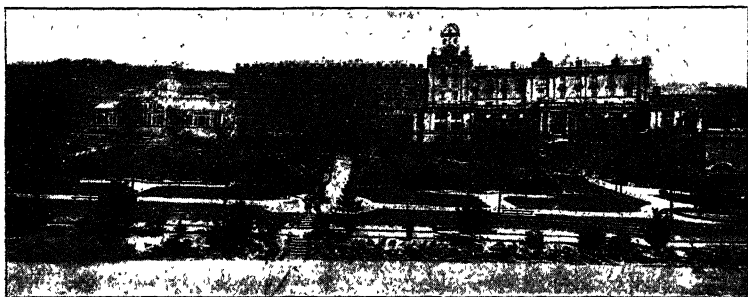
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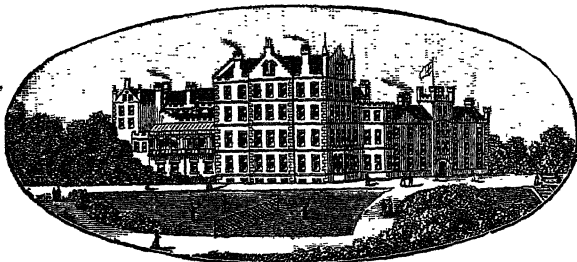
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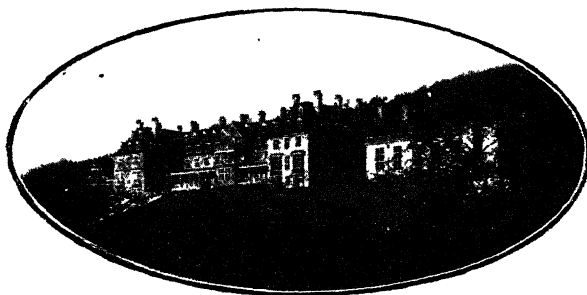
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Hospital for Mental Diseases.

President: The Right Hon. EARL MANVERS.

THIS Institution for the reception of **PRIVATE PATIENTS** of both sexes of the **Upper and Middle Classes** only, at moderate rates of payment, is beautifully situated in its own grounds about two miles from Nottingham, and from its singularly healthy and pleasant position, and the comfort of its internal arrangements, affords every facility for the **Relief and Cure of those Mentally Afflicted**. Divine Service is held in the Institution every Sunday by the Chaplain, who also visits the Patients. Carriage and motor exercise is provided.

— FOR TERMS, ETC., APPLY TO —

DR. HUNTER, Physician-Superintendent.

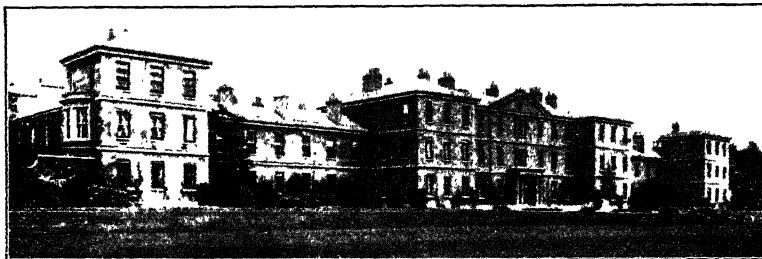
St. ANDREW'S HOSPITAL

FOR MENTAL DISEASES,

NORTHAMPTON.

FOR THE UPPER and MIDDLE CLASSES ONLY.

President—THE RIGHT HON. THE EARL SPENCER, K.G.



THIS Registered Hospital is pleasantly situated in 118 acres of park and pleasure grounds. Every facility is provided for cricket, football, hockey, croquet, lawn-tennis, bowls, golf, motoring, boating, and gardening. Voluntary Boarders as well as Certified Patients of both Sexes are received for treatment. PRIVATE ROOMS with Special Attendants, in the Hospital or in Villas in the Grounds, can be arranged.

The Hospital has a BRANCH ESTABLISHMENT at

MOULTON PARK,

Two miles from the Hospital, where there is a farm of 517 acres, which supplies the Hospital with meat, milk, and other farm produce.

BRYN-Y-NEUADD HALL, LLANFAIRFECHAN.

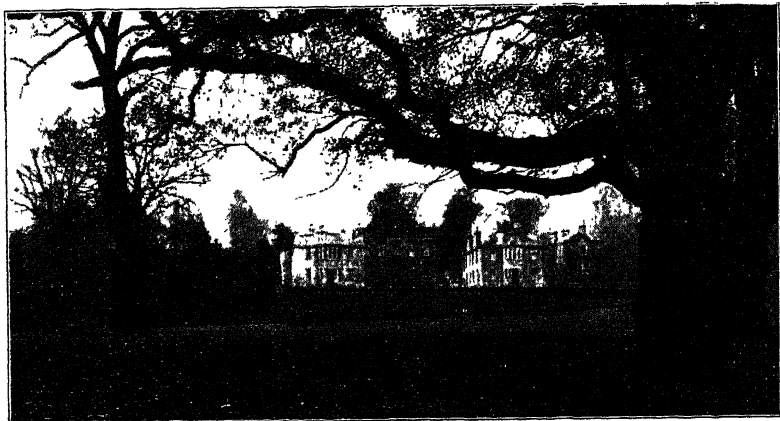


THE SEASIDE HOUSE OF ST. ANDREW'S HOSPITAL, is beautifully situated in a Park of 331 acres, close to the Sea, and in the midst of the finest scenery in North Wales. Patients can enjoy good cricket, lawn-tennis, croquet, golf, trout-fishing, and bathing. Patients or Boarders may visit this Branch for long or short periods, and can have Private Rooms in Villas in the Park.

For Terms and further particulars apply to the MEDICAL SUPERINTENDENT,
ST. ANDREW'S HOSPITAL, NORTHAMPTON. Telephone No. 56.

New Saughton Hall, ^{POLTON,} MIDLOTHIAN.

The only Private Hospital for the Treatment of Mental Cases in Scotland.



NEW SAUGHTON HALL, which takes the place of Saughton Hall, established in 1798, is situated seven miles south of Edinburgh, in the beautiful neighbourhood of Hawthornden, and Rosslyn, and is surrounded by picturesque and well-timbered pleasure grounds extending to 125 acres. There is also a **SEASIDE HOUSE** at **GULLANE, EAST LOTHIAN**.

RAILWAY STATIONS.—Polton five minutes; and Loanhead, ten minutes' walk from the Institution—reached in half-an-hour from the Waverley Station, Edinburgh. *Telephone: 4 Loanhead.* Forms of Admission for Voluntary or Certified Cases, full instructions, etc., can be obtained on application to the Resident Medical Superintendent, **J. BATTY TUKE, M.D., F.R.C.P. Ed.**

Inclusive Terms from £126 to £400 per annum, according to requirements.

BOREATTON PARK

THIS PRIVATE ASYLUM, which was founded by the late **W. H. O. SANKEY, M.D., F.R.C.P.**, for the reception of a limited number of

LADIES & GENTLEMEN MENTALLY AFFLICTED,

— is now conducted by his son, —
E. H. O. SANKEY, M.A., M.B., B.C. Cantab.

The Ladies' Division is directly supervised by **Mrs. SANKEY**.

The Mansion stands high, among handsomely laid out gardens in the midst of a picturesque deer park (about 40 head of deer are kept), and commands a magnificent view of Welsh mountain scenery.

Carriages, horses, motor, lawn-tennis, golf, trout and other fishing are provided.

Arrangements can be made to enable friends of patients to reside in the House as Boarders if so desired.

The Asylum is situate about ten miles from Shrewsbury, within easy distance of Baschurch Station, G.W.R., whither carriages can be sent at any time for visitors.

Letters and Telegrams should be addressed to—

Dr. SANKEY, Boreatton Park, Baschurch, SALOP.

STRETTON HOUSE,

CHURCH STRETTON, SHROPSHIRE.

A Private Licensed House for the treatment of Gentlemen suffering from Nervous or Mental Diseases.

ESTABLISHED 1853.

SITUATED amongst charming scenery, more than 600 feet above the sea, large grounds, pure water, perfect sanitation, and enjoying the bracing air of the "English Highlands."

Easily accessible from all parts. Good train services on G.W. and L. & N.W. Railways.

Congenial occupation and recreation are specially attended to, and all sorts of indoor and outdoor amusements are provided.

Patients have carriage exercise by arrangement, and daily walks amongst the beautiful mountain scenery.

For Terms and further information, apply to—

THE MEDICAL SUPERINTENDENT.

Telegrams :
"Stretton House, Church Stretton."



Telephone :
10, Church Stretton.

KINGSDOWN HOUSE,

BOX (Near BATH).

Telephone: No. 2 Box.

LICENSED FOR THE TREATMENT OF DISEASES
OF THE BRAIN AND NERVOUS SYSTEM.

THIS House is situate 450 feet above sea level, and commands extensive views of the surrounding country.

Access—Box Station (G.W.R.); Bath Stations (Midland and G.W.R.) twenty minutes from the house.

For terms apply to—

Dr. H. C. MacBRYAN, *Resident Proprietor & Medical Superintendent,*
at the above,

Or at 17, BELMONT, BATH.

Telephone: No. 636, BATH.

IN BEAUTIFUL COUNTRY. 18 MILES FROM LONDON.

LITTLETON HALL, BRENTWOOD, ESSEX

(400 FEET ABOVE SEA LEVEL).



A HOME FOR A FEW LADIES MENTALLY AFFLICTED. Voluntary Boarders received. Large grounds. Liverpool Street half-an-hour. Stations: Brentwood, 1 mile; Shenfield, 1 mile.

Telephone and Telegrams:

Haynes, Brentwood, 45.

For Terms, etc., apply **DR. HAYNES.**

BETHEL HOSPITAL

FOR MENTAL DISEASES,

ESTABLISHED A.D. 1713.

NORWICH.

THIS Institution is an endowed Hospital, registered under the Lunacy Acts, and managed by a Board of Governors who have no pecuniary interest in its success, but whose sole object is to promote the comfort and well-being of the Patients. The Hospital is arranged for both sexes.

The Terms for Admission are from **£2 2s. per week**, according to Patients' condition and circumstances.

CONSULTING PHYSICIAN:

SAMUEL J. BARTON, M.D.

RESIDENT MEDICAL SUPERINTENDENT:

SAVILLE J. FIELDING, M.B.

CLERK TO THE GOVERNORS:

BASSETT HORNOR, QUEEN STREET, NORWICH.

MATRON: Miss OXLEY.

APPLICATION FOR ADMISSION TO BE MADE TO THE

Resident Medical Superintendent, BETHEL HOSPITAL, NORWICH.

Incorporated by



Royal Charter.

JAMES MURRAY'S ROYAL ASYLUM, PERTH.

Chairman—The Rt. Hon. The Earl of Mansfield.

THIS MENTAL HOSPITAL, for PRIVATE PATIENTS only, is beautifully situated in the immediate vicinity of Perth, in the midst of extensive Pleasure Grounds, which are surrounded by the fields of the Home Farm.

The **INSTITUTION** has been entirely re-organized and enlarged by the addition of *two wings*, for the reception of acute cases, so as to render it an efficient *Hospital* as well as a comfortable *Home*.

The **Mansion-House of PITCULLEN**, which is quite separate from the Asylum, and **THE EAST AND WEST VILLAS**, afford the necessary variety of accommodation for modern treatment. **SEVEN GABLES, ELIE**, the sea-side house, is arranged for the reception of those suffering from Mild Mental Disturbance, and for Convalescents.

For Prospectus, Terms, etc., apply to the—

Telephone—
No. 104 Perth.

Physician Superintendent, DR. MAXWELL ROSS.

Bucks Mental Hospital.

THE COMMITTEE OF VISITORS are prepared to receive

PRIVATE PATIENTS on Moderate Terms.

Separate accommodation is provided for private patients on the Male and Female sides of the Institution.

The Hospital is situated in the Country, three miles from Aylesbury Station, and about forty miles from London.

For further particulars apply to the MEDICAL SUPERINTENDENT,

DR. H. KERR, STONE, AYLESBURY.

BAILBROOK HOUSE, BATH

For the Care and Treatment of Ladies and Gentlemen
Suffering from Nervous or Mental Breakdown.

Special Attention is given to the Curative Treatment of Early Cases.

Resident Licensee: DR. NORMAN LAVERS.

Beautiful Mansion standing in 25 acres of well-wooded Park, with lovely views of Bath and surrounding country. Ten minutes' drive from G.W.R. and Midland Stations, Bath. Telephone 49 Bath.

Motor-Car, Carriages, Billiards, Lawn Tennis, Croquet. Fishing, Boating, Golf, etc., near.

VOLUNTARY BOARDERS RECEIVED.

Suitable LADY PATIENTS can be received into

LAMBRIDGE HOUSE "ANNEXE"

A charmingly situated old-fashioned house standing in its own grounds. A House is taken at the Seaside for the Patients during the Summer months.

*The Electric Trams to Bathford pass the entrance gates of
Lambridge House and Bailbrook House.*

Terms Inclusive, from Five Guineas per week, according to circumstances of case and accommodation required.

The PLEASAUNCE, YORK.

Old Established MENTAL HOME for LADIES.

Telephone: 184 YORK.



Licensed for 22 Ladies of the Upper & Middle Classes. The House stands in extensive well-wooded Grounds within the boundary of the city.

A special feature is made of the Treatment of incipient Mental Cases, Certified or Voluntary.

Terms and Prospectus on application to the Licensees—

LEONARD D. H. BAUGH, M.B.; (Mrs.) JANIE S. BAUGH, M.B.

THE WARNEFORD

HEADINGTON HILL, OXFORD.

A Registered Hospital for the Care & Treatment of both Sexes of the Upper and Middle Classes, when suffering from Nervous and Mental Disorders. . .

President—THE RIGHT HON. THE EARL OF JERSEY.

Chairman of the Committee—REV. WM. ARCHIBALD SPOONER, D.D.,
Warden of New College, Oxford.

Vice-Chairman—

SURGEON-GENERAL SIR A. FREDERICK BRADSHAW, M.A., K.C.B.

THIS HOSPITAL is pleasantly situated on Headington Hill, on the outskirts of the City of Oxford. The grounds, which extend to over 70 acres, command extensive views of the surrounding country.

The buildings are arranged, so far as is compatible with the requirements of a Mental Hospital, in the manner of an ordinary private residence.

VOLUNTARY BOARDERS ARE RECEIVED.

For terms and further particulars, apply to the—

Physician Superintendent, ALEX. W. NEILL, M.D.

THE GRANGE, Near Rotherham

CARE & CURE OF MENTAL INVALIDS (Ladies).

A SANATORIUM OF THE HIGHEST CLASS FOR THE

Consulting Physician: CROCHLEY CLAPHAM, M.D., F.R.C.P.E.

Resident Physician: G. E. MOULD, M.R.C.S. Eng., L.R.C.P. Lond.

Physician for Mental Diseases to the Sheffield Royal Hospital.

THE House is a spacious Family Mansion, with extensive pleasure grounds, including good Croquet and Tennis Grounds, and an immense Park, containing Private Drives and Walks of several miles in extent. It is situated in the heart of the famous Robin Hood Country (5 miles from Sheffield, 4 from Rotherham) and is surrounded by beautiful scenery, and an atmosphere free from smoke and impurity. Situation dry and healthy. The arrangements are of a domestic character. The Proprietors welcome visits from the usual Medical Attendant of the Patient during her residence. Under the New Act Voluntary Patients can be received, without Certificates, on own personal application. The Rev. R. T. C. SLADE, Mus. Bac., Vicar of Thorpe-Hesley, acts as Chaplain, and conducts regular Services.

The Resident Physician may be seen at the Grange; or at Leavygreave House, Hounsfield Road, Sheffield, by appointment. (Nat. Tel. No. 34, Rotherham.)

GRANGE LANE STATION (N. S. & L. Railway) is within a quarter of a mile of the Grange, and may be reached via Sheffield or Barnsley direct; or via Rotherham changing at Tinsley.

FOR TERMS, FORMS, &c., APPLY TO THE RESIDENT PHYSICIAN

CLARENCE LODGE,

CLARENCE ROAD, CLAPHAM PARK.

A LIMITED number of **LADIES** suffering from **MENTAL** and **NERVOUS DISORDERS** are received for treatment under a Specialist. The House stands in large grounds.

For further Particulars see Illustrated Prospectus from the Proprietress.

Telephone: 494 Brixton.

MRS. THWAITES.

SPRINGFIELD HOUSE

NEAR BEDFORD.

TELEPHONE No. 17.

AN INSTITUTION FOR THE
CARE AND CURE OF THE INSANE.

TERMS: From 4 guineas weekly.

Medical Officers { DAVID BOWER, M.D.
CEDRIC W. BOWER, Surg.-Lieut. R.N.

Cornwall Mental Hospital, BODMIN.

CAREW BUILDING—A DETACHED BLOCK FOR
MALE & FEMALE PRIVATE PATIENTS

This Building is quite distinct from the Main Building,
and has separate Recreation Grounds.

For TERMS and FURTHER PARTICULARS, apply to the Medical Superintendent.

CORPORATION MENTAL HOSPITAL, PORTSMOUTH.

Accommodation is provided for Ladies and Gentlemen in Two Detached Villas, at a charge from **Three Guineas** upwards, including all necessaries except clothing.

APPLY, MEDICAL SUPERINTENDENT.

ESTABLISHED 1814.

NORTHUMBERLAND HOUSE,

GREEN LANES, FINSBURY PARK, N.

Telephone No : 888 North.

Telegrams : "Subsidiary," London.

An INSTITUTION for the Care and Treatment of Ladies and Gentlemen suffering from NERVOUS and MENTAL AFFECTIONS.

Four miles from Charing Cross ; nearest Station, Finsbury Park (G.N. and N. London Railways) ; Tubes to City and West End. Electric Cars from Finsbury Park Station run every few minutes past the gates.

Six acres of ground, highly situated, facing Finsbury Park.

Private Villas, in suites of rooms.

Voluntary Boarders received without certificates.

SEASIDE BRANCH AT WORTHING.

For Terms and other particulars apply to RESIDENT PHYSICIAN.

ESTABLISHED 1824.

The Retreat Private Asylum,

NEAR ARMAGH.

For the CURE and TREATMENT of Ladies and Gentlemen of the Upper and Middle Classes suffering from

MENTAL AND NERVOUS DISEASES.

Voluntary Boarders and Inebriates admitted without Medical Certificates.

This Retreat is beautifully situated in picturesque grounds and farm of nearly 150 acres, and Patients enjoy the greatest possible liberty. There is a large percentage of Recoveries on recent admissions.

For particulars apply to Resident Medical Superintendent,

Dr. J. GOWER ALLEN, J.P.

ST. GEORGE'S RETREAT

BURGESS HILL, SUSSEX.

This Private Asylum is under the Management of a community of Augustinian Nuns. It receives Lady Patients only, who are under the immediate care of the Sisters, and are visited regularly by a physician of special experience. The establishment is supplied with every requisite for the treatment and well-being of the Patients ; and the grounds (280 acres) afford ample space for their recreation and exercise. It is within two miles of Burgess Hill Station, on the London and Brighton Railway, and is easily accessible from all parts of the kingdom.

For particulars and terms apply to—

THE REV. MOTHER SUPERIOR, ST. GEORGE'S RETREAT.

HOLLOWAY SANATORIUM

VIRGINIA WATER.

*A Registered Hospital for the CURE and CARE
of the INSANE and of NERVOUS INVALIDS
— of the MIDDLE and UPPER CLASSES. —*

THIS Institution is situated in a beautiful and healthy locality, within easy reach of London. It is fitted with every comfort. Patients can have Private Rooms and Special Attendants, as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Boarders not under Certificates can be admitted.

There is a BRANCH ESTABLISHMENT at CANFORD CLIFFS, BOURNEMOUTH, where Patients and Boarders can be sent for a change and provided with all the comforts of a well-appointed home.

For Terms, apply to the RESIDENT MEDICAL SUPERINTENDENT,
St. Ann's Heath, Virginia Water, SURREY.

CITY of LONDON MENTAL HOSPITAL

Near DARTFORD, KENT.

Under the management of a Committee of the Corporation of the City of London.

PRIVATE PATIENTS are received at the rate of One and a half Guineas per week and upwards. An Illustrated Booklet giving full particulars can be obtained from the Medical Superintendent. The Institution is within two miles of Dartford Station, on the S.E. Railway, and is about 16 miles from London.

Telephone: DARTFORD 57.

Telegraphic Address: CITY ASYLUM, DARTFORD.

OTTO HOUSE,

47, North End Road, WEST KENSINGTON, W.14.

Telephone: Hammersmith, 1004.

A HOME FOR THE CARE AND TREATMENT OF LADIES
MENTALLY AFFLICTED.

Apply to Miss BRODIE (Resident Lady Superintendent),
Mrs. SUTHERLAND (Licensed Proprietress).

EAST SUSSEX COUNTY MENTAL HOSPITAL.

Accommodation is provided for Private Patients at £1 17s. 4d. a week, to include all things necessary, except clothing. The Estate comprises 400 acres, and is situated on high ground nine miles north of Eastbourne, and four miles west of Pevensey Bay. There is a separate detached block for children. For particulars apply to

The Medical Superintendent, The Hospital, HELLINGLY.

ASHWOOD HOUSE,

KINGSWINFORD, STAFFORDSHIRE.

An old-established and modernized Institution for the Medical Treatment of Ladies and Gentlemen Mentally Afflicted.

THE House, pleasantly situated, stands in picturesque grounds of forty acres in extent, with a surrounding country noted for the beauty of its walks and drives. The climate is genial and bracing. Occupation, indoor and outdoor amusements, and carriage and other exercise amply provided.

TERMS vary according to requirements as to accommodation, special attendance, etc.

TELEPHONE: 19, KINGSWINFORD.

Railway Stations: Stourbridge Junction (G.W.R.), $3\frac{1}{2}$ miles; Dudley (L. & N.W.R.), 4 miles; Wolverhampton (G.W.R. or L. & N.W.R.), 7 miles.

FOR FURTHER PARTICULARS APPLY TO THE MEDICAL SUPERINTENDENT.

NORTHWOODS HOUSE,

WINTERBOURNE, near BRISTOL.

A Sanatorium for Ladies and Gentlemen suffering from Nervous and Mental Disorders.

SITUATED in a large Park, 300 feet above sea level, in a healthy and picturesque locality, easily accessible from London, Bristol, and Cardiff by Winterbourne Station; or from Fishponds, Yate, or Patchway Stations.

Voluntary Boarders received without Certificates.

For further information, see London Medical Directory, p. 2133, and for Terms, etc., apply to Dr. J. D. THOMAS, Resident Medical Proprietor, Northwoods House.

Dr. THOMAS attends at 64, PARK STREET, BRISTOL,
on Mondays and Thursdays, from 12 to 1.30 o'clock.

TELEPHONE No. 18 WINTERBOURNE.

THE RETREAT, YORK.

ESTABLISHED
1792.

A Registered Hospital for the Treatment of Mental Diseases.

Under the management of a Committee of Members of the Society of Friends. Situated about two miles from York Station. The Patients are derived from the Upper and Middle Classes, and none are paupers or rate-aided. Terms from £4 4s. weekly.

Voluntary Boarders are received on their own application.

For further particulars see the Annual Report, which will be sent on application to Dr. BEDFORD PIERCE, the Medical Superintendent. Nat. Telephone: 112 York.

THROXENBY HALL, Near SCARBOROUGH.

A Branch House connected with The Retreat, York, situated near the Bainscliffe Woods, about two miles from Scarborough, for the reception of Convalescent Patients, also for the treatment of persons suffering from incipient or mild forms of Mental Disorder who cannot be certified as of unsound mind, and who wish voluntarily to place themselves under skilled treatment.—For further particulars apply to the MATRON, THROXENBY HALL, SCARBOROUGH; or to Dr. BEDFORD PIERCE, at THE RETREAT, YORK. Nat. Telephone: 282 Scarborough.

RETREAT TRAINED NURSES DEPARTMENT.

Staffed by Nurses who have been trained for four years in the Retreat, and conducted upon a profit-sharing basis. MENTAL and NERVOUS CASES only undertaken.

TRAINED FEMALE NURSES, ☐ Apply MATRON, Retreat, YORK.
£2 3s. Weekly. ☐ Nat. Tel. 112.

BARNWOOD HOUSE, GLOUCESTER.

A REGISTERED HOSPITAL for MENTAL DISEASES, for PRIVATE PATIENTS Only, of the UPPER and MIDDLE CLASSES.

ARRANGED and furnished with all the most approved appliances for the treatment, comfort, and amusement of the Inmates. Within two miles of the Railway Station, and easily accessible by Rail from London and all parts of the kingdom. It is beautifully situated at the foot of the Cotswold Hills, and stands in its own grounds of 250 acres. Voluntary Boarders not under certificates are admitted. The Manor House "Annexe" will be utilized for their reception.

For Terms, etc., apply to ARTHUR TOWNSEND, M.D.,
Telephone: No. 7 BARNWOOD. Resident Superintendent.

PLYMPTON HOUSE, PLYMPTON, SOUTH DEVON. ESTABLISHED 1834.

PLYMPTON HOUSE is licensed for the accommodation of both sexes, and is well adapted by its position and appointments for the **Medical Treatment and Care of Patients of the Upper and Middle Classes, suffering from MENTAL DISEASE.**

The proprietors, Dr. ALFRED TURNER and Dr. J. C. NIXON, have had very large experience of Mental cases, both in public and private institutions, and everything that can be done to ameliorate the condition of the chronic, and promote the cure of the acute cases—placed under their charge—is guaranteed.

TERMS ON APPLICATION. Letters and Telegrams:
Telephone: No. 2 PLYMPTON. DR. TURNER, PLYMPTON.

DERBY MENTAL HOSPITAL.

ALBANY HOUSE, a Detached Block for FEMALE PRIVATE PATIENTS.

TERMS: 1½ GUINEAS PER WEEK and upwards. This includes everything except clothing. This Villa is distinct from the main building, and has separate recreation grounds.

For further particulars, apply to the Medical Superintendent,

Dr. S. R. MACPHAIL, Rowditch, 'DERBY.

PRIVATE ASYLUMS. CO. DUBLIN.

HAMPSTEAD, Glasnevin, for Gentlemen | HIGHFIELD, Drumcondra, for Ladies.

For the Cure and Care of Patients of the Upper Class suffering from
Mental and Nervous Diseases and the Abuse of Drugs.

Telephone No. 1032.

Telegrams: "Eustace," Glasnevin.

These Hospitals are built on the Villa System, and there are also Cottages on the demesne (154 acres), which is 150 ft. above the sea level and commands an extensive view of the Dublin Mountains and Bay.

Voluntary Patients admitted without Medical Certificates.

For further information apply for illustrated prospectus, etc., to the Resident Medical Superintendents: DR. HENRY MARCUS EUSTACE, Highfield, Drumcondra, or DR. WILLIAM NIELSON EUSTACE, Hampstead, Glasnevin; or at the Office, 41, Grafton Street, Dublin. Telephone 198. On Mondays, Wednesdays and Fridays, at 2.30 p.m.

FIDDINGTON HOUSE, MARKET LAVINGTON, WILTS.

Telephone: Lavington 11.

Telegrams: "Benson, Market Lavington."

THIS Old-established Home for the Care and Treatment of **LADIES and GENTLEMEN MENTALLY AFFLICTED** is pleasantly and healthily situated, and stands in over 15 acres of Pleasure Grounds, Gardens, &c. Every indoor and outdoor amusement provided for the Patients, including Billiards, Cycling, and Carriage and Motor Exercise. Voluntary Boarders received without Certificates. *Railway Stations*—Lavington, G.W.R., 1½ miles; Devizes, G.W.R., 6 miles. 1½ hours from London.

For Terms, etc., apply to J. R. BENSON, F.R.C.S. Eng., Proprietor.

CAMBERWELL HOUSE, 33, PECKHAM ROAD, S.E.5

Telegrams: "PSYCHOLIA, LONDON."

Telephone: New Cross 1057.

For the Treatment of MENTAL DISORDERS.

Completely detached Villas for Mild Cases. Voluntary Boarders received. 20 acres of grounds. Cricket, tennis, croquet, and all indoor amusements. An Illustrated Prospectus, giving full particulars and terms, may be obtained on application to the SECRETARY.

Senior Physician: FRANCIS H. EDWARDS, M.D., M.R.C.P.

HOVE VILLA, BRIGHTON—A Convalescent Branch of the above to which also those whose condition permits may be sent for a change.

WHITECROFT, CARISBROOKE ISLE OF WIGHT.

MENTAL PRIVATE PATIENTS, LADIES, are received at the ISLE OF WIGHT ASYLUM, situated in a beautiful part of the Island. Detached House, with separate Ground, from **30s. per week**. Additional advantages can be arranged as desired.

For further particulars and necessary forms apply to the **MEDICAL SUPT.**

UPLANDS.

A Large Detached Villa, in connection with the Cheshire County Asylum, MACCLESFIELD, for the **RECEPTION OF PRIVATE PATIENTS** of both sexes. FEES, from £1 15s. upwards, according to accommodation. Apply for Prospectus to—

H. DOVE CORMAC, M.B., M.S., Medical Superintendent.

TELEPHONE: MACCLESFIELD 17.

BOOTHAM PARK, YORK.

A REGISTERED MENTAL HOSPITAL
for the Treatment and Care of Nervous and
Mental Invalids of the Upper & Middle Classes

For Particulars apply to the Medical Superintendent—

GEORGE RUTHERFORD JEFFREY, M.D. Glasg., F.R.C.P.E., F.R.S.E.

The Lawn, Lincoln.

A REGISTERED HOSPITAL for MENTAL DISEASES,
situated in the City of Lincoln, near to the Cathedral.

FOR TERMS, APPLY TO

DR. RUSSELL, *Resident Medical Superintendent.*

HERRISON, DORCHESTER.

THIS Home for Private Patients is delightfully situated, with all modern conveniences for the treatment of the Insane. Terms on application to the MEDICAL SUPERINTENDENT, HERRISON, DORCHESTER.

Telephone: 28 Dorchester.

Telegrams: "Herrison, Dorchester."

The SILVER BIRCHES, Church Street, EPSOM.

This Home has been established over 60 years for the Care and Treatment of Ladies suffering from Mental Ailments.

TERMS, etc., on application to—

Miss M. O. DANIEL, *Res. Licensee*, or to Dr. E. C. DANIEL, *Co-Licensee*.

Telephone: 346 P.O. Epsom.

WYE HOUSE ASYLUM, BUXTON, DERBYSHIRE.

Telegrams—
130 BUXTON.

Telephone—
BUXTON 130.

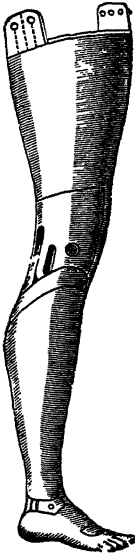
It is situated on an eminence commanding extensive views of the surrounding country. The House is heated throughout by means of hot-water apparatus and open fireplaces. Buxton is situated on the mountain limestone formation, 1,000 feet above sea level. The climate is wonderfully bracing, and its reputation as an inland watering place for invalids is undoubted.

Terms and Particulars of Wye House can be obtained on application to the Medical Superintendent - - - W. W. HORTON, M.D.

ALLEN & HANBURY LTD., LONDON.

MANUFACTURERS OF
Surgical Instruments, Orthopædic
 Appliances, Hospital Furniture, &c.

SPECIALITIES:—



**ARTIFICIAL LIMBS
 SURGICAL BOOTS
 LEG INSTRUMENTS
 AMBULATORY SPLINTS
 SPINAL SUPPORTS**

AND ALL KINDS OF

**ORTHOPAEDIC
 APPLIANCES**

A suite of comfortably furnished Fitting Rooms is provided with lift to convey patients from ground floor, with staff of competent fitters, male and female, always in attendance.

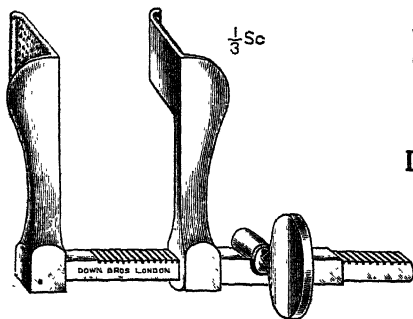
**ALLEN & HANBURY LIMITED,
 48 WIGMORE STREET, LONDON, W.1**

Telephone No.:
 6476 (Four lines) Mayfair.

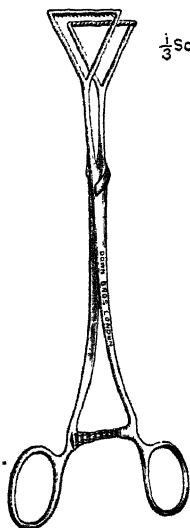
Telegraphic Address:
 Orthopedic. Wesdo, London.

Instruments for Lung Surgery.

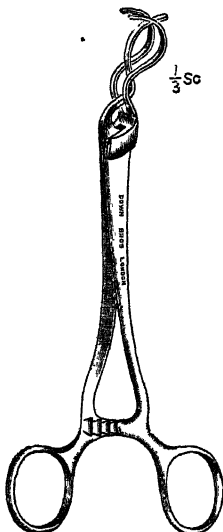
AS USED BY
Dr. PIERRE DUVAL, Etc.



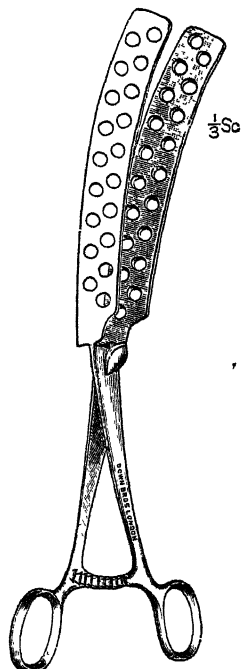
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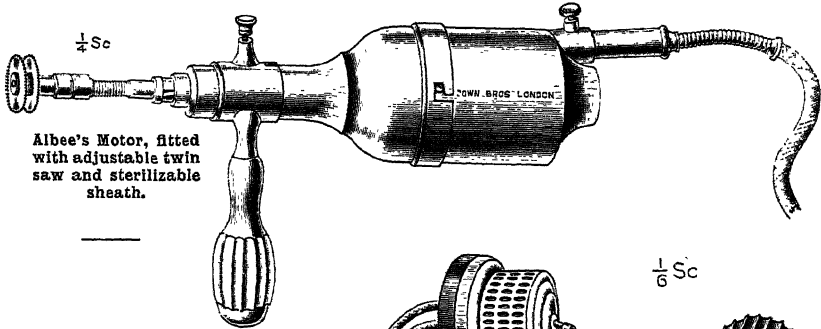
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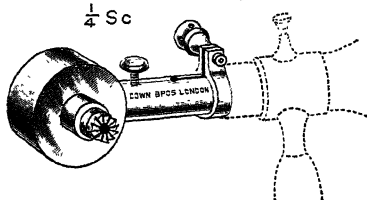
BONE SURGERY.

ALBEE'S ELECTRO-OPERATIVE INSTRUMENTS

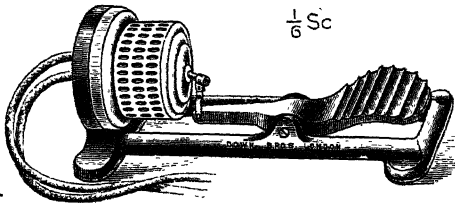
As made for H.M. Government. (Can be worked on any Current available.)



Albee's Motor, fitted with adjustable twin saw and sterilizable sheath.

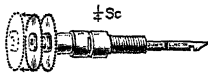


Albee's Apparatus for cutting bone dowels.

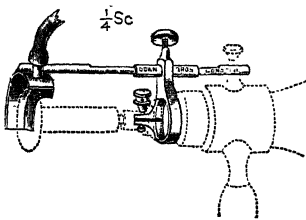


Footswitch to control speed of motor.

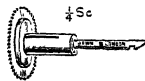
Complete List of Dr. Fred. H. Albee's Instruments on application.



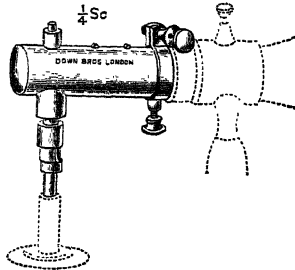
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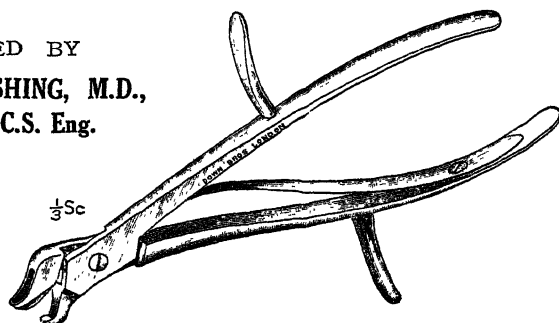


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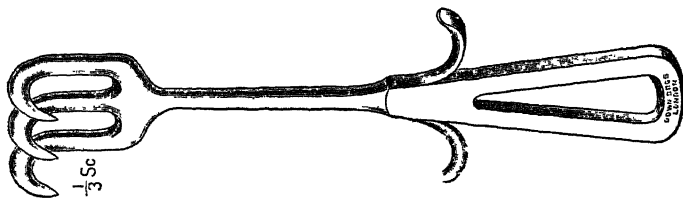
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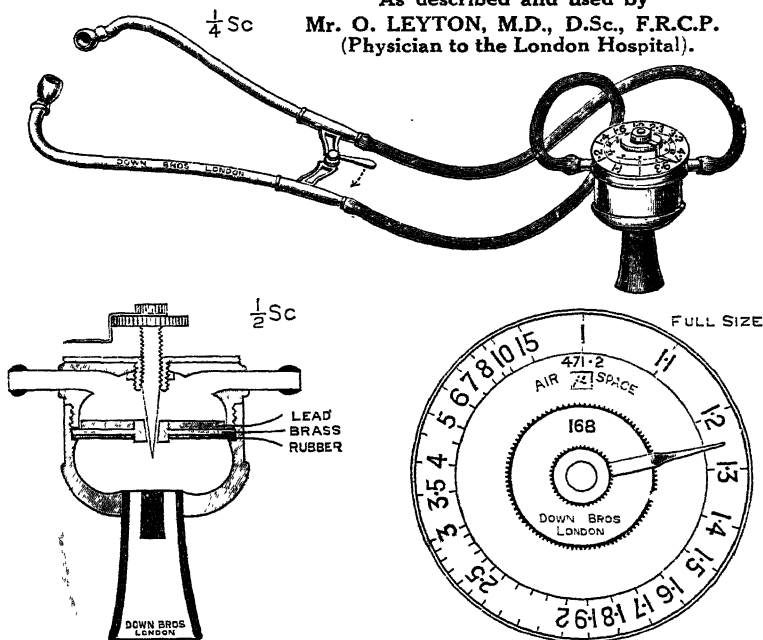
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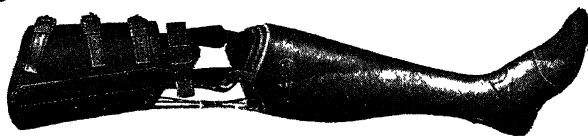
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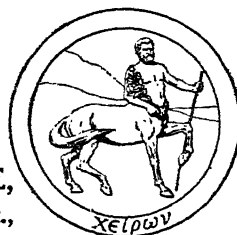
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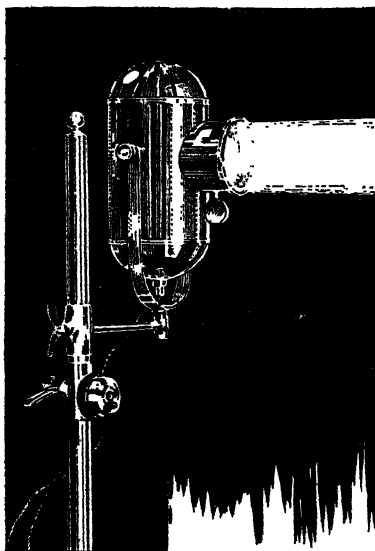
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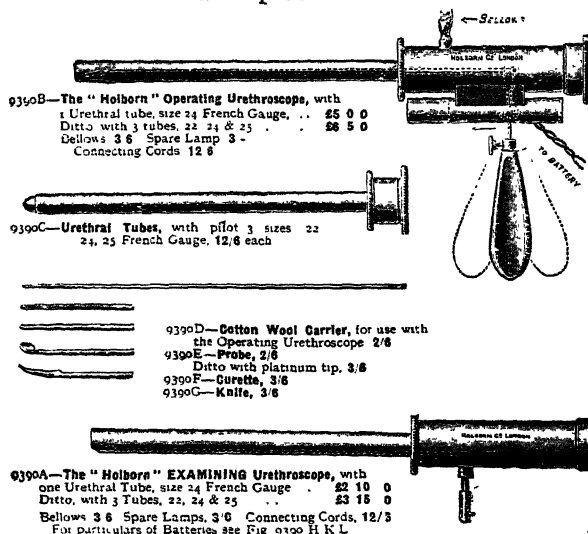
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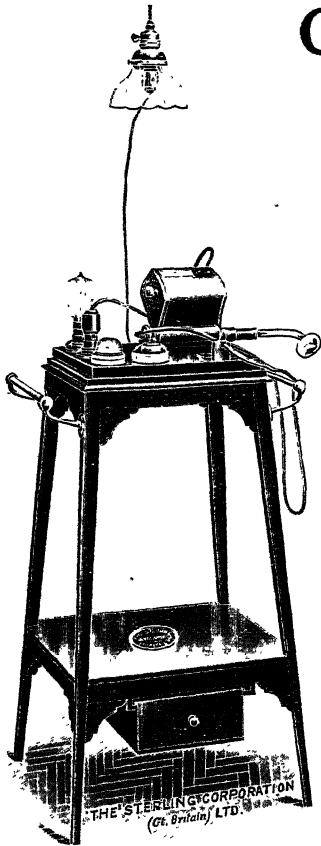
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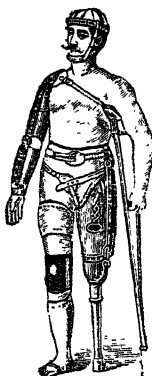
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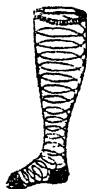
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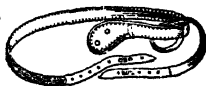


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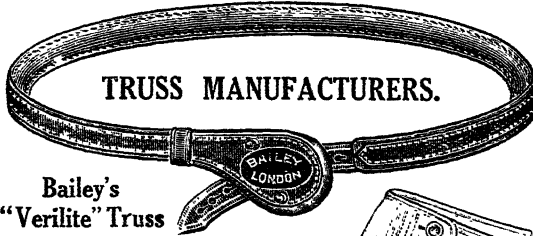
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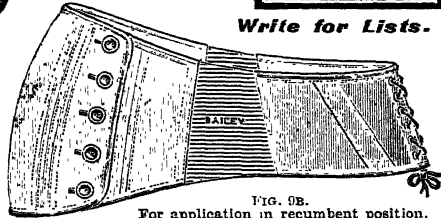


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FIG. 9B.

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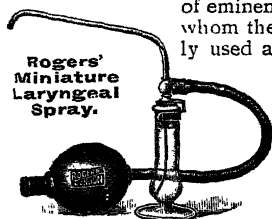
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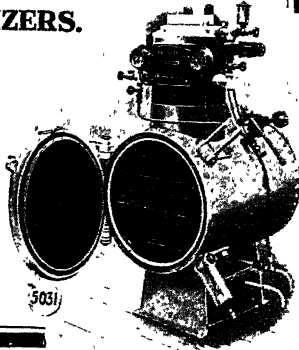
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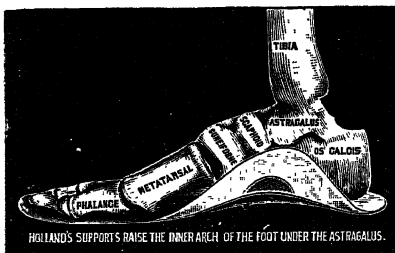
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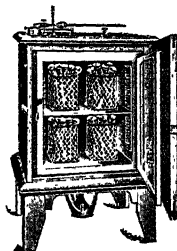
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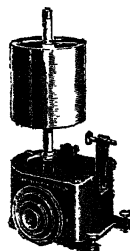


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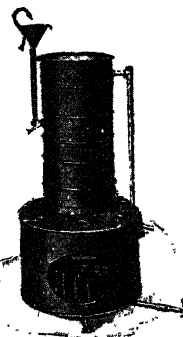
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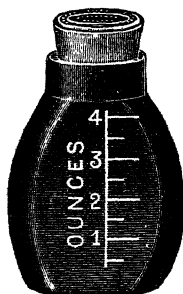
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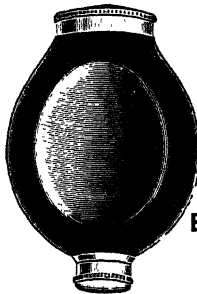
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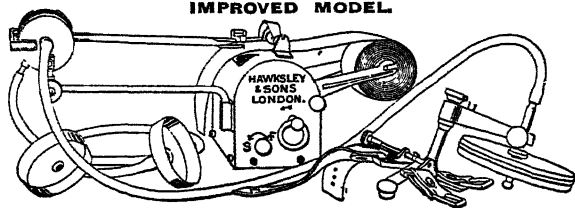
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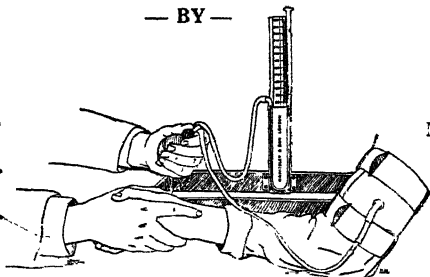
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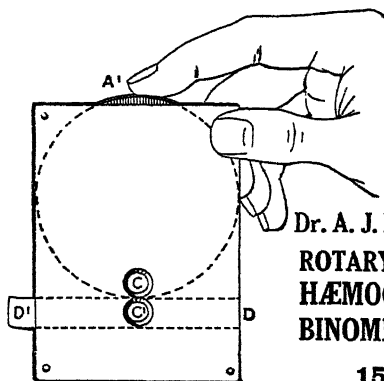


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